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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VI.

JANUARY, 1930

No. 1

ANNUAL GRADUATE FORTNIGHT

*Functional and Nervous Problems
in Medicine and Surgery
October 7 to 19, 1929*

NEUROSES FOLLOWING ACCIDENT *

FOSTER KENNEDY,
Professor of Neurology, Cornell University Medical College

Lately the chairman of the New York State Society of Industrial Medicine stated that 26 per cent of all hospital admissions in the United States in 1927 were cases for compensation adjustment. The compensation law has existed since 1914. It has already produced a change and a complication of part of our medical problems. You may have noted that the title of this address is not that in common use, namely, traumatic neuroses. "Neuroses following accident" has been chosen instead to avoid prejudging the causative factor of the nervous condition under review. The juxtaposition of noun and adjective leads to the easy assumption that neurosis following injury is necessarily caused by that injury.

At the outset, we must recognize that it may be only initially related to the injury or accident. The real origin may be fear produced by wrong medical diagnosis—or avarice, from hope of increment, played upon by legal counsel, relatives and friends. It is not difficult to adjust compensation in most general surgical injuries due to accident. The disability and apprehension produced by the

* Delivered October 9, 1929.

loss of a limb or an eye require no very expert appraisal. Legal adjustment of nervous ills, however, may be puzzling and vexatious. However, individual decisions must be individually arrived at and to insure justice it is important, if possible to ascertain the condition of the injured person before the accident.

In the millions of nerve cells in the gray matter of the brain and cord with their enormous aggregation of processes there exists the complicated mechanism in which are represented our highest mental function and the main spring of physical action. In what manner, mental processes and emotional states are evolved from or through nervous structure is as yet hidden from us. Our ignorance becomes the more plain in those nervous disorders known as "functional," the symptoms of which are subjective. There is evidence, however, and overwhelming evidence, that structural nerve changes underlie subjective clinical manifestations. There must be organic change causing or paralleling our psychic phenomena. But what these may be, the finer stains of gold and silver and the most careful chemical analysis have as yet failed to disclose. They must be empirically known by their symptoms and not by their basic conditions.

Many suits for damage following accident are based upon occurrences of purely functional nervous affections.

To quote Sir John Collie: "It is unfortunately the experience of most physicians that nervous people, who are given to self-examination, unconsciously foster subjective sensations which their stronger and better balanced neighbors would ignore. The idea of illness or a possible injury and its consequences obsesses them. Their pains are real, but often psychic. Such people are victimized by their unstable nervous system. Too often they make no stand against morbid introspection. Frequent gossips with others who have found themselves in similar circumstances, continual rehearsals of the illness or the accident, and the oft-repeated recital of sensations, all act as co-operating factors in bringing about a condition of auto-

suggestion, in the diagnosis and treatment of which the medical profession is lamentably backward."

When a man after severe shock or fright, which has produced no serious physical injury, complains of many subjective sensations it is not easy to believe, and often hard of proof, that the sufferer is not often an impostor, who is pretending disease and exaggerating trifles for gain. Often, however, the symptoms, though indefinite and difficult to prove and to some extent beyond the man's control do not *necessarily* disappear after the suit has been ended; when motives for deceit no longer exist. We must remember that we are one and all suggestible—that seven-tenths of our opinions are accepted by us from other people. We would go to the stake for the belief that the moon draws the tides, but no one has proven it. We would fight doughtily on behalf of classical education because we have been exposed to such. We accept masses of opinion for fact as long as the opinions are consonant with our emotional trends. We buy a Democratic newspaper because we are Democrats and Republican sheets because we are Republicans. Most of us are unreasoning beings given over to the power of suggestion, and almost the strongest suggestion acting upon us is that which binds us in our group. We do not much criticize suggestions which we want to hear; we only criticize and cast out suggestions antagonistic to our preconceived emotions and our aims. These conditions largely are the psychical material which underlie the making of a neurosis. Many of the neuroses we see in civil life might be called litigation neuroses; the accident is often only the peg on which the neurosis is hung. It is of course fitting that persons injured through the negligence of another should be properly compensated for their disability. It is, however, natural that the temptation to bring spurious or exaggerated claims is great. Nervous disorders following accident are accompanied by many difficulties both in and out of court. Each man has, if he be dishonest, his price. However, on the other hand, if honest, a man has his saturation point of trauma. A succession of injuries may break down his

morale and give rise in him to fixed fear trends, which put an end to his earning capacity, sometimes, and always reduce his usefulness.

Ericksen was the first to write of the nervous manifestations incident to railway accidents. He wrote in the time when men's thoughts were entirely materialistic and he believed that these symptoms were due to disturbances of the molecular elements of the cord. This narrow and improper view was challenged by Page who energetically demonstrated that most of the curious nervous symptoms seen after railway accidents were the more or less immediate concomitants of the profound mental emotion aroused by the traumatic character of the occurrence. Strümpell and Oppenheim then described the clinical picture following general commotion of the nervous system, as "traumatic neurosis." In these early discussions of the subject the importance of suggestion on the mind of the patient was inadequately weighed but out of these discussions the truth gradually emerged that even after *the slightest* injuries general functional disorders not infrequently could occur. Such neuroses are not disease pictures of any special type but may all be classified under the name of other well recognized conditions, of which the most important, to use old-fashioned names, are hysteria, neurasthenia or anxiety states, hypochondriasis and other mixed types of depression. Incidentally there is a crying need for better definition of terms used in psychopathology. Neurasthenia has been used for a generation to cover almost all abnormal states of a highly depressed and anxiety character and hysteria is too often identified in the minds of both doctors and laymen as malingering. Both of these words have become the battered ornaments of medical speech, but on the whole they have greater precision of idea and a larger vitality than can be claimed for many neologisms coined of late by the new psychology.

Speaking broadly, we can divide the neuroses following accident into two groups, (1) the neurasthenic anxiety state including all abnormal generalized emotional condi-

tions following injury; and (2) hysteria following injury, including those cases in which abnormal emotional states have become modified by the development, through suggestion, of some functional deterioration of a localized character.

Much may be learned of nervous instability in general from that occurring in soldiers in war. After 1916 confusion arose from the common acceptance of the word "shell shock" to cover all cases of nervous instability occurring in the course of war. Under this heading were mixed cases of amnesia, anergic stupor, sleeplessness, nightmare, mutism, functional blindness, tremors, palsies and anxiety states, occurring not only under fighting strain but also in individuals who failing in self-confidence suffered thoughts and apprehensions while still awaiting transportation over seas.

The most important fact in war neuroses and, in my opinion, this applies also to industrial life, is that *almost never were generalized psychoneuroses seen in soldiers suffering also from physical wounds of any consequence or degree*. After shock or strain the degree of emotional destabilization varied inversely as the amount of gross physical injury.

On the other hand, minor injuries sustained in danger under great emotional and physical tension may become psychically elaborated without any conscious desire to malingering. Almost all injuries of the extremities in my experience were accompanied for a short period by a natural "defense immobilization" of the limb; natural reaction from pain in tired persons. A flesh wound of the upper arm, for instance, easily produces in such men the impression of inability to move the wrist and hand. Any doubt expressed by the physician—or even by a lawyer (*sic*)—as to whether or not, for example, an injury to the brachial plexus might not possibly account for the condition of the hand, sows the seeds of a fixed idea which later may assume a very sturdy growth. To the weaker kind of men a minor wound offers an opportunity of tem-

porary alleviation of their lot in war, and among the same order of people in peace time it may develop an idea of grievance against the civilian employer or the rich corporation, which should have carried him about his business in safety; and there may be added early shadowy ideas of financial opportunities then open to him. In the soldier and civilian of the feeble fabric of humanity there may thus be produced an emotional condition in which suggestions tending to augment the gravity of the injury in question are readily acceptable nor are they willingly submitted to critical judgment or experiment which might possibly establish their trivial character. It is not out of place, therefore, to point out here the importance of having these patients seen as quickly as possible by someone with *accurate technical knowledge*.

The power to make a careful physical examination, to weigh evidence with precision, to differentiate sharply organic from psychical symptoms, is the only power which will give the physician enough self-confidence to be able to communicate healing to his patient. Time and again has one seen a half doubt in diagnosis preventing the coming together of physician and patient. If the physician be not entirely certain of the nature of the functional or psychical condition, his power to cure it will be inhibited by his suspicion of an organic nerve lesion on the one hand or conscious malingering on the other.

In short, functional motor and sensory palsies and functional perversions of the special senses are created by "localized suggestion" directed towards an affected faculty or member, and can be cured by like means and only by like means. To distinguish them quickly from similarly appearing organic states is the first and most important step in their treatment and one which, having been taken firmly and accurately, will give the physician the authority and self-confidence needed to exorcise the system of false ideas immediately producing the condition. I say "immediate," for in these cases due to localized suggestion there is an underlying mental conflict, the strain of which pro-

duces in other men anxiety states or other psychoneurosis, still more disabling for civil or military duty.

We are indebted to Freud and his school for the re-discovery that neurotic symptoms may be produced by the antagonism of mutually incompatible emotional trends. The great mass of material made available by war demonstrates the general rightness of this principle, but still more definitely displays the peculiar wrongness of the detail with which it has been applied, and entirely invalidates the conclusions—asserted as pontifical dogma—that the sexual instinct, albeit in various disguises, is the only dynamic force possibly concerned.

The emotions associated with acquisitiveness and with gregariousness or group-loyalty operate powerfully after civil injury, and make it obligatory on all having to do with such patients to see to it, that accurate diagnosis be established by expert physicians, and second, that final adjustments of all claims for compensation be made quickly. The writer—as a physician—strongly deprecates the system of giving weekly stipends to persons suffering from nervousness following injury. Compensation should be awarded as soon as diagnosis has been established; it should be in bulk as a single sum, and if possible the case should be closed beyond reopening, to allow “litigation neurosis” to disappear.

It is of course possible in severe violent accident that any part of the body may receive physical injuries of any severity. Functional nervous disorders may complicate such injuries but here again one may see that the more severe the physical injury the less likely will it be complicated by functional affections. Such affections may follow a fall on the sidewalk, or the mere witnessing of, without sharing in, some catastrophe. They may occasionally develop through fear and suggestion when no thoughts of litigation exist; on the other hand, prolonged neuroses have been quite rare as the aftermath of such terrific natural catastrophes as earthquakes where the perpetuation of pecuniary aid was impossible.

In ordinary depressive states one often finds that the nervous system has never been entirely stable or that it has become more susceptible to disease influences through the weakening effects of excess or strain. Undoubtedly the weakling is more prone to develop neurosis after injury than is the man of strength, originality and character but one must remember that limited nervous reserves are often found in finely constructed bodies. On the other hand, every man is suggestible and, as with metals, has his modulus of elasticity and strain. Often as a result of profound fright or after a long period of conflict and strain, there may come a situation carrying with it such emotional disorder as renders helpless the will-power to endure. Such a case was that of an officer of my acquaintance who, having borne the racking experience of the landing and trench fighting at Gallipoli, one day, when jumping to what he took for solid ground, found himself—as he put it with a gesture of infinite disgust—squelching thigh-deep in decomposed Turkish dead. For weeks this experience recurred to his consciousness, both by night and by day, and in dreaded interruption to his normal train of thought, rendering him for that period incapable of duty, a prey to the paralyzing influences of both repulsion and fear.

Associated with such symptoms, or often occurring independently, are various losses or perversions of localized function usually classed as hysterical stigmata. These may persist after the patient has resumed superficial emotional control. On the whole, however, mutism, deafness, blindness, functional monoplegia, paraplegia and hysterical spasms of the limbs are the result of localized suggestion rather than of a generalized anxiety state.

A false idea of injury accepted by a patient over a long period and supported by apparently good evidence and authority is often difficult to remove. The suggestion of injury may be so elaborated and so firmly agglutinated to the mind that it is next to impossible to lift it out.

Disabilities, the result of improper or incorrect suggestions accepted in good faith by the patient, are not ma-

lingering. For example, a young gunner was wounded in May, 1915 by a shell fragment on the inner side of the left upper arm. For eight weeks the arm was held by apparatus in a horizontal position to allow of irrigation and dressing. It was then found to be completely paralyzed, atrophic, hairy, and cyanosed. The patient was examined by numerous medical boards, was invalided out of the army and awarded a pension on the basis of total paralysis of the left arm. The British Red Cross secured for him a position as elevator boy, the duties of which he could accomplish easily with his right hand. He was entirely satisfied with his treatment and he was content, to say the least of it, that the war had done no worse by him. He was allowed to seek aid from military hospitals if he wished, and in February, 1918, he came of his own accord to a London hospital to which I was temporarily posted, to ask that the arm should be taken off at the shoulder, as it interfered grievously with his activities, and, as he said, because he was tired of putting his useless arm into his sleeve. He was referred to me by the surgeon who saw him, to know if it would be worth while to dissect the brachial plexus, which presumably was caught in the scar of his wound, rather than accede to his demand that his arm be amputated. Examination revealed that the trapezius was paralyzed, together with all the muscles of the arm itself, a condition which clearly could not come from an injury to the nerves below the level of the shoulder. In short, his only organic ailment was a partial ulnar paralysis and minor secondary adhesions in the shoulder joint through immobilization. The rest of the paralysis was induced by his belief, inculcated by every consultation, that he could not move the arm. This man had nothing whatever to gain by the removal of the arm at the shoulder, and is a case to be remembered when we too lightly identify patients with hysteria or suggested paralysis with malingerers.

The perversions and abrogations of function due to localized suggestion are of all types. Further the suggestions producing these conditions are most varied. Identical dis-

abilities may come, through a trivial blow, or as a result of a more serious injury, from the diagnostic or verbal indiscretions of a physician.

Indeed, the chief characteristic of the hysterical mental state is suggestibility. The patient is constantly subject to such influences similar to those used in hypnotism. This is certainly the most adequate explanation for the origin of the disorder; by it can be explained such symptoms as are purely psychic manifestations. Thus, an actor, 47 years old, fell from the flies of a theater on his back; he was not seriously hurt but two days later became aphonic, a condition which lasted several months. He then had the misfortune to fall from a moving train. On this occasion he received no demonstrable physical injury but was very much astonished to find he could talk as well as ever and has had no difficulty in speaking since.

Exaggerated psychic manifestations of trance, catalepsy, alterations of personality, and the like, are only occasionally observed in hysteria, provoked by accident; memory may be much impaired, there may be forgetfulness of the accident, and subsequently there may be periods of almost total amnesia. It is essential to understand that according to our modern notions of hysteria, the derangement of sensory function does not imply any derangement of the sense organs themselves. It has been abundantly proved that a patient with hysterical blindness sees; that sensations from anesthetic skin areas are received if not perceived, just as we are unaware of the roar of traffic about us when immersed in an interesting novel. It is useless, however, to enter into theoretical speculations on the physical pathology of hysteria. Nothing is known regarding *anatomical* changes responsible for the symptoms of this disease. Of late years I have often wondered how strangely the sequelae of epidemic encephalitis mimic certain hysterical phenomena. So that it would almost seem as though in some of these cases the individual expresses himself less through his recently acquired nervous system and more by the antique structure of the brain situated in

and below the basal ganglia. However such ideas are as yet entirely speculative.

The psychic character of a profound left hemianesthesia was well demonstrated in one of my patients who, during my rounds, was sitting propped up in bed with her arms crossed. When the arms were pricked, her eyes being closed, she felt nothing in the right arm which was lying in the left anesthetic field, and, until she discovered her mistake, felt accurately in the previous anesthetic left arm, which lay in the field of normal sensation.

Janet ascribes these palsies of special sense to diminished powers of attention in the patient, who, as a concentrative measure cuts out of his sphere of consciousness a stream of incoming sensations. If the circumstances of the onset and development of hysterical symptoms be analyzed, one will usually find some factor of concrete local determining character. It is proper, however, to point out that while we may understand a man who has struck his friend following subconsciously the Biblical command to "cut off his right hand," we cannot as yet determine the exact elements in that man which make it necessary for him to adopt this self-denying ordinance, in contrast to those who do not. Hysteria is, however, always a refuge from a reality unacceptable to the patient, whence it follows that hysteria rarely or never occurs in him who faces issues squarely, nor ever seeks to evade consequences by self-deception. Hysterical blindness is prefaced by blindness to facts and ideas, and is an inadequate solution or postponement of an unpleasant problem, by a weak personality; it may also be a vehicle to bear the patient to the oblique attainment of an illegitimate desire.

Allied to hysterical anesthesia, of which by the way, the patient rarely spontaneously complains, is hyperesthesia. In hysteria following injury there is very frequently found enormously exaggerated sensitiveness of the injured part. The slightest touch may produce evidence of extreme pain.

Disorders of special senses are usually unilateral and occur most frequently on the side of the body which is

already the seat of cutaneous anesthesia. There may be contracted visual fields for color. It is perfectly possible that many defects of special sense are unwittingly suggested to the patient by the physician in the course of examination. All types of motor paralysis, characterized sometimes by flaccidity, often by spasm, may occur. The skilled observer will soon appreciate that these motor symptoms do not follow organic lines. The reflexes are unchanged. A complete hemiplegia, for instance, may exist with normal abdominal reflexes on the affected side and no alteration of the plantar reflex on that side. *As-tasia abasia*, a term invented by Blocq, is a hysterical affection of the legs in which, although retaining their power in other things, they are unable to support the body in standing or walking. In this condition anesthesia is usually absent.

There is usually an interval between the occurrence of an accident and the development, in fine flower, of the disease picture; an interval called by Charcot, the period of meditation, during which insidious suggestions play their part. It is during this time, however, that the patient's mind can best be turned from the contemplation of his own misfortune. Thus mental supervision together with ordinary simpler methods of therapeutic change can in many cases banish the early symptoms instead of allowing them gradually to become worse. It must always be remembered, however, that the neurotic has a lowered threshold of mental and emotional stimulation and that some few cases develop true hyperthyroidism after shock.

It is not surprising that the claim agents, or the lawyers for a company, whose medical knowledge must at least be superficial, and who so constantly are witnesses of attempted frauds, should be skeptical as to the justice of claims which are oftentimes based upon symptoms the existence of which cannot be definitely proved. Even physicians, without special experience in general nervous disorders do not appreciate the possible gravity of such conditions.

When the functional and subjective nature of the traumatic neuroses first became the subject of general interest, simulation was supposed to occupy an important place in their genesis. It was not then, however, properly appreciated that malingering is the conscious, and hysteria the subconscious assumption of a disease picture. Suggestion and wishful thinking make gross conscious deception unusual, and indeed to some extent even unnecessary.

PROGNOSIS

It is undoubtedly true that the traumatic neuroses usually begin to improve when litigation has ended, and of all remedies financial compensation is the most speedy and the most certain in its action. An attempt has been made before to show how a delusional system of ideas held for a long time and supported by what the patient regards as authority is often difficult to remove. One may say that without closing litigation and satisfying the patient economically, such a delusional system of ideas cannot be cured, and occasionally even though the emotional atmosphere be made satisfactory by the above circumstances the bad tenant of a neurasthenic idea may be difficult to evict. Dr. Raphael Lewy, chief medical examiner for the Compensation Commission of the State of New York, even goes so far as the following: "I have stated in referring to my article on neurosis following trauma, that I cannot conceive how disease can be ended by monetary remuneration. On reconsidering the matter, however, I realize that such monetary remuneration must be considered as a therapeutic agent to help the individual to dissociate his mind from his functional neurotic condition. . . . Indeed, I do not know of a single case, from my very large material, which was ever disposed of unless the individual received a monetary remuneration to his own satisfaction. I may also state that in some cases the remuneration did not dispose of the case, as the individual endeavored to reopen his case after having disposed of the money which he had received."

The hopes for recovery of health are enormously better if there be no question of litigation, and if the proper moral influences can be brought to bear on the patient immediately after the accident. Under these circumstances the outlook for recovery should be very good. Preceding organic disease, especially arteriosclerosis, renders the process more grave.

TREATMENT

How does one cure a paralysis due to a false system of ideas or a loss of special sense due to suggestion, or a fear state due to the agitation of litigation and anxious hope? The removal of objective by closing litigation is the first requisite. After that we need accurate technical knowledge. That is the only power that will give men trained like you and me the power to cure symptoms due to disordered thinking and feeling. It is through knowledge of the body that we doctors can acquire sufficient confidence in ourselves to cure the mind. Have you ever wondered wherein lies the power of the quack; wherein lay the power of, for instance, M. Coué? It lay in his ignorance. I am not being ironical when I say that, nor am I being harsh with M. Coué whom I respected. I am being what I believe to be completely truthful—his power lay in his ignorance. I spent much time with M. Coué, watching him and seeing his methods. All cases of paralysis, for instance, looked alike to him. He paid no attention whatever to whether a person had an hysterical or a spastic paraplegia. To him they were the same. He told them both that they would get entirely well. The hysterical paraplegia got well—and Coué remembered him; the spastic paraplegia did not get well and Coué forgot him. He had the very antithesis of the scientific mind, in that he gathered up into his mental furniture only those cases that aided his thesis; so he went from peak to peak of success in his own mind; he cured a great many people because he believed he could cure them and because he saw no reason why he should not believe that he could cure them, because he always forgot the cases he did not cure.

Now we doctors have been brought through the schools. When we see a case of paralysis we see always along side of it in our minds, a microscopic section of hopelessly degenerated tissue. You see we have suffered an exposure to pathological knowledge. Therefore when we see loss of function at the bedside, we see at the same time in our mind's eye the loss of structure, as shown by the microscope. That knowledge, that visual image inhibits us from telling that man to take up his bed and walk. We feel a little foolish because we feel that perhaps he will not take up his bed and walk, by which we would lose both his respect and respect for ourselves. So, if you have not accurate technical knowledge you may *suspect* you are dealing with an hysterical paraplegia but if you are not *certain* you say to him, "My dear Sir, don't you think you could walk?" And the man hears the doubt in your voice, he sees you have no iron in your soul, that you have no personal conviction, and he says, "No, of course I can't." But, if the quack goes to him and says, "Get up, you can walk," he feels conviction, he hears the ring of truth. He gets up and he walks, if his paralysis is due to a false idea which he has nourished. Therefore, in the examination of these cases it behooves us all to have a neurological scheme of examination whereby the nervous system can be examined with as much accuracy and as much system as are the heart and lungs. If you have such a scheme, such a mode of attack, on a case suspected of being neurological many errors would be avoided. Further, in examining a neurotic, after an accident, don't only consider the accident and the man before you, but what kind of a wife has he? is there a mortgage on his house? is he in debt? How much savings has he? Are his children ill? The conclusion may lie in his wife's bad temper. And that may be due to her bad health or his bad manners.

Hysteria and malingering are often dove-tailed and come together in one mind, and many symptoms begun as malingering end as hysteria by suggestion. In the great majority of cases one cannot tell easily what is virtue and what is vice. Just as few of us know if we are all good

or all evil, we are in truth neither white nor black, just gray.

Sometimes we need resource and invention to deal with novel situations.

Shortly after the war a patient, said to be a Central European who had served in the United States Navy, was sent to me at the Neurological Institute from the Marine Hospital, for an opinion. He alleged he could speak no English, that he could understand no English, and that he could not walk but in a few words of English he maintained that his condition had come through war service. He demanded compensation for life on the plea of total disability. My examination failed to show any definite sign of organic disease. However, he certainly could not be made to stand, and he certainly seemed unable to talk English, or any language that I knew. I felt baffled, but most doubtful of his good faith. I therefore asked my house officer to pass into him the longest stomach tube he could find. Then there was poured one-half pint of Scotch whiskey into the end of the tube, the bottle being shrewdly wrapped in a towel so that he did not know what was being given him. In half an hour I returned to find the ward in an uproar and my friend up and about passing hilariously from bed to bed saying in a rich Milesian accent, that "this was absolutely the finest hospital he had ever been in."

I am afraid I have wearied your ears with a twice told tale, but indeed I have but set down in general terms the nature of this problem.

In doing so, only the psychological aspects have been regarded because these are more accessible and in a sense more malleable than the underlying physiological change upon which they must depend. I am not unmindful of the flux in the balance of the involuntary nervous system, the alteration of glandular function, the cardiac arrhythmias nor even the dyspneas accompanied by increased absolute blood acidity—but of such things we lack knowledge

precise enough for action. As yet they throw no light on the intrinsic nature of the mind. Therefore, perforce we must deal with mental phenomena rather than with Mind and apply with some empiricism psychological remedies to psychological ills.

THE SURGICAL INDICATIONS FOR SYMPATHETIC GANGLIONECTOMY AND TRUNK RESECTION IN THE TREATMENT OF DISEASES RESULTING FROM VASOMOTOR SPASM OF PERIPHERAL ARTERIES *

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The permanent increase in surface temperature, the result of increased flow of blood following sympathetic ganglionectomy and trunk resection, has aroused new clinical interest in the treatment of peripheral vascular diseases. Besides the accepted vasospastic disorder in Raynaud's disease, numerous diseases which affect the extremities develop as the result of impaired circulation. Careful distinction should be made between diseases that arise from vasospastic phenomena and those that result from an occlusive lesion of the blood vessels. Only in cases in which vasospastic disturbances are present will benefit be derived by section of the sympathetic fibers of the arteries.

SURGICAL PROCEDURE

The surgical procedure employed consists in thoroughly interrupting the vasomotor impulses to the arteries of the extremity to be treated. These impulses are carried over the thoracolumbar sympathetic outflow, by white rami communicantes, as preganglionic fibers, to end in synaptic relation with the thoracic or lumbar sympathetic ganglions. The impulses are then carried by postganglionic,

* Delivered October 9, 1929.

gray fibers, which also include fibers supplying the pilomotor muscles and the sweat glands, to reënter the spinal nerves, and to be distributed with the spinal nerves in the somatic musculocutaneous distribution.

Thus, to destroy effectively the vasomotor control of the arteries, it is necessary to section the gray rami, or the preganglionic or postganglionic fibers before they reënter the spinal nerves for their final distribution to the arterial system. Jaboulay and Leriche, in their early work, attempted to accomplish this by periarterial sympathetic ganglionectomy. They believed that the innervation was centrifugal or centripetal in distribution, but since the anatomic studies of Kramer and Todd and Potts, who showed that the distribution corresponded to the musculocutaneous distribution of the spinal nerves, it is easy to understand why so many results were incomplete, as only a few of the vasomotor fibers were interrupted. Leriche and Fontaine still believe there is an intramural ganglion of the arterial wall that has to do with vascular tone. Ransom stated that there are sensory fibers, carrying impulses from the viscera to the spinal cord, which have their ganglion cells in the dorsal horn of the cord and pass inward through the white rami; this accounts for the partial or total relief of pain in angina when the stellate ganglion is removed. I would like to believe that a similar arrangement of sensory fibers is connected with the arteries, in order to explain the sudden relief of pain that follows sympathetic ganglionectomy, but Orbeli believes this is due to the lowering of the sensitiveness to pain.

Royle,¹⁹ in attempting to relieve spastic paralysis, introduced the operation of ramisection; but since the gray rami are not constant in origin or distribution, it became apparent that many fibers were overlooked during the operation. Hence, Adson and Brown¹ introduced ganglionectomy and trunk resection to assure completeness. Thus, in treating a lesion of both lower extremities, I would perform bilateral lumbar ganglionectomy, including the second, third and fourth lumbar ganglions, besides

resecting the accompanying lumbar sympathetic trunk. This procedure thoroughly interrupts all postganglionic fibers descending to the lumbar and sacral nerves. The lumbar ganglions do not receive preganglionic fibers below the second lumbar ganglion. Simple section of the sympathetic trunk below the second lumbar ganglion would be sufficient if it were certain that these lower ganglions did not receive stray postganglionic fibers from the first lumbar ganglion. It is believed wiser to err on the side of safety by doing too much rather than too little, since complications from this operation do not arise.

More difficulty was encountered in the treatment of vasospastic diseases of the upper extremities than was encountered in treating those of the lower extremities, since the anterior or lateral approach to the stellate, cervicothoracic ganglion did not always permit of complete removal of the ganglion or thorough interruption of the vasoconstrictor fibers to the extremities. Neither did the Royle²⁰ ramisection of the brachial plexus accomplish the desired results. An operation needed to be devised to permit sectioning of the thoracic sympathetic trunk below the second thoracic ganglion, since Kuntz had demonstrated gray fibers passing to the first thoracic nerve directly from the second thoracic ganglion. July 31, 1928, I performed such an operation for Raynaud's disease. A posterior approach into the mediastinum was employed. After resecting the second rib in close proximity to, and including, the transverse process, the second thoracic ganglion, the first thoracic ganglion, and the lower cervical ganglions were removed with the intervening sympathetic trunk. Since then, numerous similar operations have been performed. Even though this operation was extensive and should have included all vasoconstrictor fibers to the head, neck and extremities, the occasional Horner's syndrome failed to remain permanent after the operation. This suggested that gray, postganglionic fibers were entering the carotid plexus; therefore I recently have changed the operative procedure by resecting the vertebral portion of rib instead of the second. The lateral portion of

verse process is also resected with the rib in order to facilitate the exposure, which permits entrance into the mediastinum opposite the first thoracic sympathetic ganglion. The first thoracic ganglion is then dissected free and the trunk resected just above or below the second thoracic ganglion, depending on whether the second is situated high or low with relation to the second thoracic nerve. If the second thoracic ganglion is not removed, the first thoracic nerve is carefully dissected from the intervertebral foramen to its juncture with the brachial plexus in order to interrupt thoroughly all gray rami that may ascend from the second thoracic ganglion. After elevating the thoracic ganglions and trunk, the entire lower cervical ganglion is resected with the chain. This alteration in the technic has produced a complete and permanent bilateral Horner's syndrome, and I hope has included all vasoconstrictor fibers to the upper extremities. The clinical results have been equally good with both technics. The anatomic studies of Kuntz have been verified by my associates and me; the lower cervical ganglion and the first thoracic ganglion are infrequently fused in man into the so-called stellate ganglion found in lower animals. This accounted for the incomplete results by the superior anterior approach, since only a portion of the ganglion, or only the lower cervical ganglion, actually was removed.

VASCULAR INDEX

In order to select suitable cases, some basis, or index, had to be developed which would serve as a measuring stick, not only to determine the presence or absence of vasospasm but to determine the probable results of an operation. The clinical skin-thermometer gave the changes in skin temperature. The Stewart-Kegerreis calorimeter gave the heat production and radiation before and after operation, but still the means of determining accurately the degree of vasospasm before considering the application of surgical treatment was lacking. Adson and Brown¹ then proposed the "fever test." Although the volume of blood that flows through the peripheral arteries cannot

be measured, it can be determined relatively by changes in skin temperature. This principle is employed in the fever test.

The patient is placed on a cot in a room in which temperatures can be taken accurately. The electrodes of constantan and copper of the electrothermocouple are then fastened to the various areas over the fingers, toes, hands, feet and body, in preparation for readings. The first readings record the room, skin surface and mouth temperature of the patient to be studied, in order to compare them with the readings of a normal person and to be further checked against the readings of the same patient at the height of the fever test. The fever is then produced by administering hypodermically a foreign protein; for example, 25,000,000 to 75,000,000 dead bacilli in triple typhoid vaccine, the dosage depending on the size of the patient. Hourly readings are made until the maximal rise of fever has been obtained. These readings are compared with the initial temperatures, to determine whether the elevation of temperature is that for a normal person, or is that for a patient with a vasospastic or occlusive disease. On studying the temperatures of a normal person, it will be observed that the mouth temperature will have increased to an average of $3^{\circ}\text{C}.$, whereas the skin temperature over the digits will have increased 9° to 12° , or three to four times more than the mouth temperature, thus indicating that the peripheral arteries have been opened by relaxation of the vasomotor system and that more blood has been permitted to flow to the periphery.

In patients suffering from Raynaud's disease, a vasospastic disorder, the difference is still greater, since the initial surface temperature over the digits is lower than that of a normal person exposed to the same room temperature. In patients with general arterial sclerosis there may be little, if any, difference in the temperatures before and after administration of the foreign protein, indicating that the vessels are incapable of relaxing to allow increase of the flow of blood to the periphery. In case of thrombo-

angiitis obliterans it is possible to determine whether or not there exists a vasomotor spasm of the unoccluded arteries; it is possible, too, to determine, by individual readings, the condition of each digit. Therefore, this test serves as an index, and unless the rise in temperature of the skin over the digits is two or more times greater than the rise of the mouth temperature, the condition is considered inoperable. If, due to occlusive lesions or to permanent changes in the arterial walls, the febrile state fails to cause relaxation of vasomotor spasm, so will the operation fail.

RAYNAUD'S DISEASE

Raynaud's disease represents the classic vasoconstrictor disturbance affecting the hands and feet. Little has been added to the original descriptions given by Raynaud in 1862 and in 1874. His studies brought out conclusively that there is a form of gangrene without demonstrable organic lesions or occlusion of the arteries. It is distinguished from the milder cases of vasospastic disorders of the extremities which simulate Raynaud's disease, but which, apparently, do not progress and are not sufficiently troublesome to warrant a surgical procedure. These include the minor cases of acrocyanosis in which the major disturbances consist in cold, cyanotic, moist hands or feet not accompanied by pain or trophic disturbances. Some persons have disturbances which occur chiefly in the winter months, and which are relieved by exposure to heat, change of location, or change of climate. These patients complain, chiefly, of attacks of pallor involving one or more digits, associated with numbness or aching, but they do not complain of severe pain or trophic changes. There is no contraindication to operating on patients of this group, but I am of the opinion, as is Brown, that sympathetic ganglionectomy should be employed only when the symptoms are progressive, incapacitate the patient, produce trophic changes, and when they fail to respond to the simpler medical procedures. However, it should be borne in mind that these mild, vasospastic disorders may

give rise to such diseases as scleroderma and chronic arthritis and, therefore, that they should not be ignored. The patients should be observed from time to time to prevent the abnormal conditions developing to such a degree that they are irreparable surgically.

Raynaud's disease is characterized by the presence of symmetric changes in color of the extremities. It may involve the upper, lower, or all extremities. Occasionally the knees, elbows, nose, and lobes of the ear are included in the process. The blanching of the skin is brought on by exposure to cold or by emotional influences. This soon is followed by the cyanosis which continues until the vasospasm subsides. In the early stages, this is accompanied by discomfort, then by an ache and finally by severe pain. As the disease progresses, the color changes become more marked and the skin remains more or less cyanosed unless the condition is relieved by application of heat externally. The gangrene in Raynaud's disease differs from the gangrene which occurs in occlusive lesions in that it produces dry ulcers at the tips of the fingers or toes, with distorted growth of nails, instead of complete gangrene of one of the digits. If the process is allowed to continue, the gangrene will ascend and will be extremely painful. The patient usually complains of subjective numbness, which interferes with the function of the extremity and adds to the general discomfort and incapacitation. The disease does not always progress to the severe forms; hence, the milder types may be controlled by changing occupation. If the patient is financially able to move to a warmer climate during the winter months, moving may control the disease. The addition of warmer clothing, or the application of heat, serves to ameliorate the symptoms. But the patient who has continuous symptoms and in whom trophic changes develop had better submit to the operation rather than to continue suffering. The surgical shock and risk is no greater than that of an ordinary laparotomy. During approximately five years, I have performed 162 operations on seventy-three patients, with only two deaths. Both of these occurred in patients suffering

with thrombo-angiitis obliterans. One was from pneumonia; the other, from postoperative ileus.

The results obtained are so satisfactory that they more than offset the inconvenience of the surgical procedure. The patient is immediately relieved of the pain, the cyanosis disappears, and the skin becomes warm, pink and dry. The ulcers heal and the nails take on normal growth. The patient again is restored to normal condition and can continue with his vocation. Since more than four years have elapsed since the patients were operated on, I am reasonably sure that the results will be permanent. I have never seen any postoperative sequel develop after lumbar ganglionectomy. The skin, of course, remains dry, which if it annoys the patient can be relieved by rubbing on oil, such as cocoa butter.

The Horner's syndrome follows cervicothoracic ganglionectomy. If this is bilateral the patient rarely complains, but if unilateral, it becomes noticeable and the patient may object to the disfigurement. In my earlier cervicothoracic operations, an occasional patient complained of ulnar pain following the operation. This has been controlled by avoiding trauma to the first thoracic nerve by opening the mediastinum in the line of the first instead of the second rib. In three cases venostasis has developed following thoracic ganglionectomy; I am unable to explain this definitely. Two of these patients previously had undergone bilateral periarterial sympathetic ganglionectomy and all three had experienced marked cyanotic color changes. As long as the hands are used in the ordinary positions, as over a table, while the patient is sitting, they appear normal, but if they are allowed to hang down along the body they become dusky red and appear to be stuffed. If they are elevated over the head, they become blanched and the skin becomes wrinkled. The capillaries, as seen in the nailfolds, are large dilated loops. The condition suggests some stimulation of the vasodilator nerve or loss of vascular tone which has resulted in permanent dilatation from the long-standing course of the disease.

This phenomenon does not detract appreciably from the result, since it is not accompanied by pain, nor does it interfere with the vocations of the patients. It has been observed, also, that there is additional dilatation of the retinal arteries and an increased supply of blood to the nasal mucous membranes which increases the mucous secretion. Neither of these conditions offers contraindication to the operation. On the contrary, it may suggest results desired in the treatment of retrobulbar neuritis and atrophic rhinitis.

OCCLUSIVE DISEASES

There are two main forms of occlusive diseases of distal arteries, thrombo-angiitis obliterans, and arterial sclerosis with thrombosis. The rationale of carrying out sympathetic ganglionectomy in this group is based on the degree of vasomotor spasm of the unoccluded arteries, chiefly in the collateral vessels.

THROMBO-ANGIITIS OBLITERANS

In most of the cases of thrombo-angiitis obliterans, factors apparently were responsible for the diminished supply of arterial blood in the distal regions of the extremities. One of these factors was occlusion of the main arterial channels by the obdurating thrombus; the other was an abnormal degree of vasospasm of the collateral arteries. The relative significance of the latter factor was brought to my attention by the fact that in many cases of thrombo-angiitis obliterans the volume of blood flowing through an extremity, as measured by the rate of elimination of heat, increased markedly with increases of environmental temperature and during fever artificially produced by the administration of a foreign protein such as triple typhoid vaccine. Inasmuch as these factors suggested vasospasm of the collateral vessels, these patients were studied in much the same manner as those suffering from Raynaud's disease, except that the degree and rate of progress of the occlusive process was considered. Thrombo-angiitis ob-

literans occurs in adult life, has a predilection for young males, and is found in all races, but supposedly more frequently in Hebrews than in persons of other races. The etiologic factors have not all been determined. It is supposed that the lesion develops on a basis of infection of the intima of the arteries and that cigarette smoking is a contributing factor. But I am impressed with the fact that the lesion may also result as a trophic change due to disturbance of the sympathetic innervation. The thrombotic process varies in degree and distribution; it may affect the distal part of one principal artery or it may include all of the principal arteries of all extremities at different periods. The customary course is rather slow; the main arteries and veins of the feet and legs are affected, and later the upper extremities. If the patient has the time and the money, he can get on comfortably by discontinuing work, remaining at rest in bed, and applying heat or using vaccines, for in time canalization takes place and the circulation will be partly restored. But since many of these patients are compelled to work and to subject their feet and hands to trauma, trophic ulcers develop sooner or later and refuse to heal. These become infected, cellulitis develops, more thrombosis and gangrene appear, and amputation is inevitable. Therefore, if it is possible to relieve vasomotor spasm of the collateral vessels and thus to improve the circulation, ulceration, cellulitis and gangrene may be forestalled, and the healing of existing ulcers and abrasions may be hastened.

The ideal case for operation, then, is that of the patient who has moderate symptoms, thrombosed main arteries and veins and superimposed vasospasm of the collateral arteries with an index of two or more. It is unwise to perform the operation in the presence of an active, thrombosing process of short duration; the condition may ascend and may result in gangrene in spite of the operation. However, I believe that the improved and speeded-up circulation that results from sympathetic ganglionectomy diminishes the likelihood that a stationary process will be lighted up.

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limited to the feet and legs, or it may involve the hands, arms, face and neck, and the skin over the upper part of the chest. The muscles and bones may be included in the atrophic and degenerative process. The course of the disease is usually slowly progressive. It occurs at all ages but more frequently in young women.

It is not certain that all cases of scleroderma result from disturbances in the involuntary nervous system, but the lesions which develop in the extremities, feet, legs, hands, arms, and face frequently are preceded by vasospastic phenomena characterized by cold, sweaty, cyanotic hands and feet, simulating the symptoms of Raynaud's disease. We have also observed it in patients suffering from thrombo-angiitis obliterans, chronic arthritis, and in those with causalgia due to irritation of the brachial plexus by cervical ribs.

Therefore, in view of the fact that scleroderma develops in the presence of conditions which arise from vasomotor disturbances of the vasospastic type, we felt justified in carrying out ganglionectomy. The same vascular studies are made as those which are made in Raynaud's disease, but the indexes are lower than those of Raynaud's disease. These differences are due to thickening of the skin and to strangulation of the arterioles. The early cases have responded satisfactorily to treatment, but the advanced cases have not improved to the same degree. Difficulty has been experienced with healing of the surgical wound in three cases but this has been overcome by leaving the sutures in place longer than usual and by strapping the skin to avoid tension on the margins of the wound after removal of the stitches.

The results are those of immediate vascular improvement, and loosening and thinning of the skin over the extremities, face, and neck. The skin and muscles of the face lose their drawn expression, the mouth can be opened wider, and the tongue can be protruded. The improvement continues for months as the skin is gradually restored to normal. I have not operated on a sufficiently large num-

ber of patients to draw final conclusions, but I am convinced that the operation is indicated and will relieve the symptoms of scleroderma in all early cases in which there are histories of vasomotor disturbances, and that it will check, if not improve, the condition in the moderately advanced cases. The operation will not help in the advanced cases with vascular indexes of zero; thus, if sympathetic ganglionectomy is to be employed in the treatment of scleroderma of vascular origin, it should be employed as soon as the disease is recognized, to prevent its progress, for if it is permitted to continue, it usually results in continuous ulceration, gangrene, pain, deformity, and total invalidism.

CHRONIC ARTHRITIS

Among the various types of patients with arthritis is a group of young adults who have painful, swollen, tender joints associated with limited motion, atrophy of muscles, and loss of function. The patients also complain of cold extremities, mild acrocyanosis and excessive perspiration, with aggravated symptoms, during stormy weather. The disease in this group may be referred to as chronic polyarthritis of the periarticular type with vasomotor disturbances. There is a tendency for the condition to progress slowly; it is not altered by the removal of foci, immobilization, massage or exercises, and is only symptomatically relieved by vaccines and application of the various types of heat. Therefore, inasmuch as several of these patients presented vasospastic phenomena in addition to arthritic symptoms which had not been relieved by the usual methods employed in the treatment of arthritis, Rowntree and Adson ^{16 17 18} felt justified in applying sympathetic ganglionectomy as used in the treatment of Raynaud's disease. To our delight, we were able to relieve these symptoms by causing improvement in the circulation. The skin became warm and dry, the pain was gradually relieved, the tenderness disappeared, the swelling subsided, the atrophied muscles recovered, and motion and function returned. The same vascular studies and indications were

employed as were employed in the treatment of other vasospastic disorders.

It is possible that the operation may be indicated in selected early cases of osteoarthritis as well as in moderately advanced cases, to relieve pain and to improve the circulation, thus offering assistance in the recovery from arthroplasty.

CAUSALGIA

Causalgia is a painful condition that develops following trauma to peripheral nerves; supposedly it is limited to the median nerve. The pain is associated with local tenderness, glossy skin, muscular spasm and tender, rigid joints. Injections with alcohol, of the nerve involved, have given very little relief. Periarterial sympathetic ganglionectomy has offered occasional relief. But since this operation is limited in scope, twice I have performed unilateral cervicothoracic ganglionectomy by the posterior approach for causalgia of the ulnar and median nerve due to irritation of a cervical rib. In both cases definite vasospastic phenomena were present; in one case a finger had been removed for gangrene. Both patients had had previous operations on the cervical rib with only partial relief. Following the ganglionectomy, both were relieved of symptoms. The pain was relieved, the skin became warm and dry, muscular spasm disappeared, and function was restored. To draw any conclusion from only two cases is unwarranted, but the result is suggestive of a vasospastic factor being the underlying cause.

ERYTHROMELALGIA

Erythromelalgia is a syndrome characterized by intermittent attacks of vasodilatation of the arteries and veins of the hands and feet, symmetric in distribution, and associated with a severe, burning sensation of the skin. The skin has a mottled appearance, as if there were alternating periods of normal vasomotor tone and marked vasodilatation. During the attacks, the skin is red and the

veins dilated and throbbing. Relief is obtained by immersion of the parts in cold water and elevation of the limb.

Since the arteries are dilated, I have not performed ganglionectomy in a true case of erythromelalgia, but I did perform it once in a patient who had what appeared to be a mixture of Raynaud's disease and erythromelalgia, alternating with symptoms of vasospasm and vasodilation. The results were rather discouraging because the patient complained more of hot feet after the operation than she did before the operation. The disease is a vascular one but probably is of the vasodilator rather than the vasomotor type. Further study is necessary before offering anything specific in the way of surgical treatment.

SUMMARY

The factors of vasospasm and impairment of the circulation undoubtedly give rise to or contribute to the production of Raynaud's disease, thrombo-angiitis obliterans, scleroderma, chronic periarticular arthritis, and causalgia, and sympathetic ganglionectomy and trunk resection are justifiable procedures when palliative measures are inadequate. The results depend on the extent of the disease and the degree of vasodilatation accomplished by the operation; the extent of the disease can be determined and the effect of operation can be forecast, preoperatively, by means of careful vascular studies.

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THE ENDOCRINES AND THE VEGETATIVE NERVOUS SYSTEM *

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While it is commonly accepted, even by the most conservative, that the endocrine system and the vegetative nervous system are closely correlated embryologically, physiologically and clinically, yet the actual contacts are not always simple to prove. Furthermore it is most difficult to establish whether internal secretory products can produce their effects without the necessary presence of the vegetative fibres by direct mediation through the blood stream or not, and whether vegetative fibres can produce their effect without glandular collaboration. In some cases, such as the necessary presence of normal splanchnics for the adequate adrenal effects—as shown by Cannon—the matter is quite clear, but in the thyroid or pituitary domain much confusion exists. In the case of the thyroid for instance it had always been thought that the vegetative fibres from the cervical sympathetic were in direct contact with the acini of the gland. Now, Nonidez confronts us with evidence that these thyroid cells are absolutely free from direct vegetative fibres—these latter passing exclusively to the blood vessels of the thyroid. The effects therefore obtained by Cannon and his co-workers by connecting the central end of the phrenic nerve with the peripheral end of the cervical sympathetic and obtaining by this means methodical and regular impulses passing through the phrenic via the sympathetic to the thyroid—a hyperthyroid effect with all its concomitants even to a unilateral exophthalmos—seem to have been produced through the intermediary of an enlarged blood supply to the vessels of the thyroid and not to its secreting cells—if Nonidez is right.

But other papers of these sessions will take up the morphology, physiology and pharmacology of the vegetative nervous system and the internal glandular connec-

* Delivered October 10, 1929.

tions, and therefore I will limit myself only to the one cited instance of the difficulty in getting at the actual facts of the relationship between the two systems. My function is to present to you in as concise a manner as possible what appear to the clinician as effects of a disturbed vegetative nervous system in relation to the internal glandular system, as these perturbations affect the individual. That many errors of deduction will enter such an exposition of course goes without saying, but perhaps enough material may be shown to illustrate disturbances which at least apparently belong to this group of reciprocal activities.

Because of the similarity of embryological development between the cells of the sympathetic system and the chromaffin cells of the adrenal glands, it is meet that we begin our discussion with the adrenals. Cannon showed that adrenalin stimulates the sympathetic system, and that stimulation in turn produces the various effects of such sympathetic activity, *viz.* the coagulation time of the blood is diminished, blood pressure is heightened, blood sugar is mobilized in the blood stream, there is produced a change in the distribution of the blood mass, so that it is found mostly in the muscles and in the nervous system and is much diminished in the abdominal organs causing a cessation of activity there. All these facts tend to conserve the individual in his emergency, *i.e.*, produce most quickly at the necessary points much blood, rapidly coagulable when shed, and containing that great necessity for muscular activity—blood sugar. Active muscle, be it known, consumes three and a half times as much sugar as resting muscle. At the same time the entire nervous system is alert to direct fight or flight as may be. This fight may be one against other individuals similarly equipped or it may be against other forms of aggression such as germ assault, toxins, acute infections and shock. All such combats require relatively more adrenalin to withstand their assaults and the blood shows an increase of this secretion at these times. Crile proved that injections of colon bacilli, for instance, increased the normal adrenal supply of the blood. Frequently these noxious

agents are so devastating that the adrenal glands are exhausted of their supply and syncope results, with all the phenomena of shock. In emotional excitement, likewise, the sympathetics are involved, liberating through adrenalin, blood sugar. If such excitement is followed by muscular activity, this sugar is consumed, but if not, then frequently it passes out through the kidneys and glycosuria—transient—results. As one author graphically described it, when stocks in Wall Street go down, diabetes goes up! Applied to human individuals, what can we say of the symptoms and physical signs that are produced by reason of a disturbance of the adrenals and the correlated vegetative system? There is a large group of individuals that shows in certain specific examinations many stigmata due to such a mutual disturbance. This group is characterized by small and inadequate adrenals (proved by post-mortem examination in those that succumb) and with this deficiency, hand in hand, we see many of the following signs: (1) small cardiovascular systems; (2) low blood pressures; (3) low blood sugar; (4) long coagulation time of the blood; (5) changes in the composition of the blood, largely, a deficiency of polymorphonuclear leucocytes and an increase in the lymphocytes; (6) deficiency in other tissues such as the pituitary gland which is usually small and frequently largely enclosed; (7) small and undeveloped genitals in both males and females; and many other inadequacies in the tissues of the body. It is the group now designated by the term "status hypoplasticus." The fact that many of these cases show large and persistent thymus glands, large tonsils, Peyer's patches, enlarged spleen and a general hyperplasia of lymphoid tissue led to their original designation as "status thymico-lymphaticus." The former, more recent name is perhaps better adapted. By virtue of the deficiencies enumerated, certain symptoms present themselves which make of the victims of this condition inadequate personalities short of actual disease. These symptoms are largely produced because of the lack of the proper stimulation in time of need, of the vegetative nervous system by the inadequate

adrenals. So that "fatigue" after but little exercise whether of mind or of body is pronounced; recovery from fatigue is lengthened because of the difficulty in raising the blood sugar content; the lowered blood pressure likewise inhibits normal activity; the small pituitary and genitals lead to disturbances specific to themselves. As a result of these, added to many minor difficulties in the train of the trouble, the individuals affected feel themselves different from their more fortunate fellows and inferior to them. And so they become rather shy and shut-in, do not mix readily, feel that they cannot meet their daily problems successfully and so try not to meet them at all; are easily led by stronger minds and bodies and become more or less dependent on them. So are produced many habitues of alcohol and drugs, many of the easily led characters among the criminal classes; a large number of psychoneurotics belong to the group and their symptomatology depends largely upon the poor quality of the tissues of the body supplied by the vegetative nervous system under the sway of the adrenals; so that they have cardio-neuroses; gastric neuroses; genital and sexual disturbances; and added thereto, the mental perturbation that accompanies such states. The sympathetic division of the vegetative nervous system is the one that is at fault, for it depends on adrenalin for its emergency activities. Perhaps the parasympathetic therefore, according to the Eppinger and Hess theories, is the one that dominates the picture of deficient adrenal supply and hence the multitudinous symptoms that occur under the designation "vagotonia" more or less fit into the picture. What we have said of the adrenals is presumed to relate to the secretion of the adrenal medulla, although in recent years the cortex, to a large extent, has come into its own. From our small knowledge of the actual active principle or principles involved in suprarenal cortical activity, we cannot at present entirely separate its influence from that exerted by the entire gland. The diminution and gradual atrophy of the suprarenals, probably the cortex as well as the medulla is responsible for the gradual bodily deterioration

and disintegration known as Addison's Disease, with its lowered blood pressure, lowered blood sugar, pigmented areas, rapidly diminishing resistance to fatigue and exertion, gastro-intestinal disturbances and all the diminution in tone of smooth muscle incidental to loss of sympathetic nervous control.

(Here are shown lantern slides of individuals belonging to the group with a history of their difficulties.)

In the domain of the thyroid gland, there is seemingly as little difficulty in associating its disturbances with reciprocal activities of the vegetative nervous system, as is the case with the adrenals. However, if it is true that the cells of the thyroid secreting acini are not anywhere in direct contact with the postganglionic fibres of the sympathetic, as Nonidez has apparently shown, then the matter lies a little differently. The vegetative system can then influence thyroid activity only through the intermediary of the blood vessel control. The thyroid secretion, however, apparently has a direct influence upon the cells or upon the synaptic junctions of the vegetative—probably largely sympathetic—nervous system, lowering their threshold of stimulation. However this may be there is certainly mutual activity—so much so indeed, that once the thyroid is sufficiently aroused, the sympathetics are secondarily stimulated and in their turn via the cervical sympathetic, the thyroid vessels are brought into play and the thyroid secretion increased thereby. This produces a real vicious circle leading gradually to thyroid exhaustion (unless means are taken to break it) and ending in actual myxoedema.

The effect of thyroid activity on the vegetative nervous system is again somewhat in doubt. While there is no doubt whatever that the thyroid secretion is stimulative to the sympathetic division resulting in increased metabolic exchanges, *i.e.*, is katabolic, there is also reason to believe that it has anabolic effects as well. Occasionally one meets with a patient who shows preponderating vagus

effects with thyroid medication rather than sympathetic—but this is against the rule.

The results of excessive thyroid secretion on the organs are manifold. Among the chief ones of course are an increase of all bodily functions, especially those under the sway of the sympathetic. As a result, increased oxidation results with increase in pulse rate, blood pressure, blood sugar, body temperature and a generally increased speed of activity everywhere. This is seen particularly well in the brain and nervous system generally. The patient is speeded up in all nervous reactions, thought is more rapid, action follows judgment more quickly—there is never an idle moment. In early life, in all forms, development is quicker, maturity reached earlier. Thus Gundersen caused tadpoles to develop into frogs within three weeks on thyroid feeding, whereas the normal metamorphose takes place in ten to twelve weeks. Many of these results seemingly depend partly upon the thyroid effect on the vegetative nervous system. The symptoms arising from its vagus effects (parasympathetic) are increased peristalsis, increased perspiration and generally an increase in the gastric juice which is of greater than usual acidity. A deficiency of thyroid secretion produces the converse effects: slowing of pulse rate, lowering of temperature, lowered blood sugar and a diminished activity in mental and nervous reactions. Ratiocination becomes sluggish, motion slows down, fatigability and drowsiness are the rule. Initiative is lost. If this occurs in early life then development is retarded. This is true in the mental sphere as well as in the physical. The personality differences between the hyperthyroid and the hypothyroid individuals is at times so great that they are constantly incompatible—one too slow for the other's gait, the other too fiery for the former's lethargy. Many a human combination has been destroyed by this factional difference.

(Here slides are shown illustrative of some of the conditions cited.)

One of my patients showed very interesting thyroid effects with sympathetic concomitants at the slightest emotional stimulation. Whenever in the course of examination she related occurrences that had aggravated her, she would flush, her pulse rate increased rapidly, her thyroid gland visibly enlarged and exophthalmos was produced—all within the space of five minutes. Urine collected shortly afterward frequently showed sugar. Her customary basal metabolic rates were well within normal limits. Many similar cases might be cited.

The third glandular unit in this triple mechanism concerned largely, together with the vegetative system, with the maintenance of normal levels in the organism—or as Cannon terms it "*homeostasis*"—is the pituitary gland. Its importance may be gleaned from its excellently protected position in a skull within a skull. Normally, most investigators are agreed that as a whole it is concerned with several functions in collaboration with the vegetative nervous system. These are the control of growth, regulation of water interchange, stimulation of smooth muscle fibre particularly of the uterus and of the intestine, maintenance of blood pressure and of the sugar content of the blood, and according to some authors, exerting a control of the circulation of the cerebrospinal fluid. The various portions of the gland that specifically exert these influences are the anterior lobe for growth and fat metabolism as well as for sexual stimulation; the posterior for the pressor and oxytocic effects and water and sugar metabolism. It has for its coadjutor in some of these effects the pars intermedia. The matter of water control has recently assumed some importance because of the fact that the French investigators Roussy and Camus had apparently determined that injury to the base of the brain just posterior to the pituitary was specifically the cause of diabetes insipidus, and that theories that were based upon posterior lobe pituitary disturbance as a causal factor did not take cognizance of neighborhood effects, particularly in the region of the corpora mammillaria as the efficient cause. Also that because posterior lobe ex-

tracts—administered hypodermatically—seemed to be specific in their control of the diabetes it did not necessarily follow that injury to the posterior lobe was necessarily the cause. The theory of Roussy and Camus has held more or less sway for the past decade; but quite recently from the Department of Pathology of Chicago University came a case that mathematically demonstrated the fact that the posterior lobe injury alone, apart from any other lesion, can produce diabetes insipidus. This was a syphilitic gumma that had invaded the *posterior lobe of the pituitary only*. Serial sections of the base posterior to the hypophysis and including the corpora mammillaria showed absolute normality there. The patient's symptoms had been particularly headache of the pituitary character and diabetes insipidus. The fact is probably that there are many links in the chain controlling water exchange in the body of which the corpora mammillaria region is only one. The rationale of the diuresis has been variously explained. Possibly the correct one is that while the posterior lobe extract causes arterial tension in most of the tissues of the body, yet the arterioles of the kidney are dilated by it determining a greater supply of blood to these emunctories. This effect is probably through the vegetative fibres. Pituitary effects according to Cushing and Weed may be produced by stimulation of the fibres of the sympathetic coming from the first three thoracic nerves. These pass via the cervical sympathetic to the carotid plexus and thence to the pituitary. One of the chief effects of such stimulation is the passing of large amounts of urine of low specific gravity. Before the use of pituitrin for diabetes insipidus was common, codeine and similar drugs were used for this purpose. Their effect was probably on the sympathetic, diminishing its effect on the pituitary gland. At this point a seeming paradox may be mentioned, namely, that while stimulation of the posterior lobe produces a diabetes, injections of pituitrin control it! One meets with such paradoxes in medicine occasionally—perhaps too often in the field of endocrine medicine.

The anterior lobe has recently also been given the at-

tribute of increasing the metabolic rate. One case might be cited that contains again a paradox unless explained on this basis. The patient, a woman of forty-five years of age, was sent to the hospital complaining of headache, visual disturbances, great increase of weight, mental hebetude and great depression. Upon examination, the visual fields were proven defective in both temporal halves, she showed a mild papilloedema, her basal metabolic rate was about plus ten (determined in many laboratories) and her pituitary fossa on x-ray examination was found much enlarged, particularly anteriorly, and eroded. Of course an immediate diagnosis of pituitary neoplasm was made. Upon closer examination, however, the patient appeared to look myxoedematous rather than obese, and having come from a goitre region it was then thought possible that part of her difficulty was thyroid in character. Small doses of thyroid were given to her and the change in the entire picture was remarkable. The headaches disappeared, the visual fields became much larger, the papilloedema receded, the myxoedematous appearance disappeared and the strangest one of all the phenomena, the basal metabolic rate diminished to a point somewhat below normal! That is to say, against all rule, thyroid administration apparently diminished basal metabolism. Theoretically it seems probable that because of deficient thyroid activity the pituitary, particularly the anterior lobe, compensated for this deficiency and by enlarging for this purpose brought on the entire pituitary picture and increased the basal metabolic rate to plus ten in spite of thyroid deficiency. When thyroid was finally exhibited, contrary to laboratory indication, the necessity for compensation disappeared, the pituitary resumed its original normal condition, the symptoms thereof vanished and the woman was restored to health. She is quite well to-day with none of the pituitary symptoms or signs remaining excepting the enlarged pituitary fossa, some ten years after the original onset of her trouble. The anterior lobe probably affected the vegetative system as does the thyroid, to increase metabolism. She must constantly, however, take both thyroid

and small amounts of iodine to keep her well. It seems to me that this one case illustrates very well the interrelationship of both thyroid and pituitary anterior lobe with the vegetative nervous system—particularly the sympathetic division, and the autonomic self-regulatory and compensatory possibilities entailed in these mechanisms.

Another important case in this interrelationship between the pituitary, the adrenals and the sympathetic system is the following: A man of some thirty years of age came to the hospital with a pronounced acromegaly—a classical case, as the screen picture shows. His pituitary fossa as you see is enormously enlarged; he did not show a bi-temporal hemianopsia, but he had pronounced pituitary headaches and complained, curiously enough, of intense fatigability and general muscular weakness. Delving into his past history, we obtained the knowledge that at about eighteen years of age he had an obscure abdominal condition with diarrhoea, temperature and marked asthenia. There was a history of tuberculosis in the family and his case was denominated at the time, intestinal tuberculosis. Immediately following this, there began to appear on symmetrical areas of his body, pigmented areas, chiefly spinal root areas of the two upper dorsal levels. And within a year, his acromegaly began while a comparative freedom from his weariness and asthenia and abdominal symptoms gradually occurred. This made him moderately comfortable until a few years ago, when his headaches became unbearable and he sought relief. An analysis of his case would, I believe, place it in the category of an original tuberculosis of the adrenals with loss of sympathetic effects, with the asthenia, abdominal symptoms and pigmentations that accompany such a disturbance, gradually improving by virtue of some mechanism which might offset the adrenal symptoms. Such a mechanism is present in the posterior lobe of the pituitary gland—which mobilizes sugar, maintains blood pressure and acts as a stimulant to smooth muscle fibre—but at the cost of a compensatory enlargement. Such enlargement will then, in its turn not

only produce the necessary alleviation of the adrenal symptoms but also in addition its own specific symptoms—acromegaly, enlargement of the pituitary fossa and so on. After having reached a certain level in the acromegalic process, this remained without increase and this patient's treatment with pituitary extract, both by mouth and hypodermatically, helped him extremely.

The cases that show a small and usually markedly enclosed pituitary fossa with many of the evidences of pituitary glandular deficiency, exhibit at the same time many vagotonic or parasympathetic symptoms; low blood pressures, slow pulse, lack of initiative and tendency to drowsiness; and on the psychic level, difficulty in concentration and sustained thinking and a character of rather shut-in type, mark the vegetative disturbances in their combination with functions of the cerebrum. (The screen illustrations mark some of these cases.)

One final glandular unit with whose effects I have had some personal experience, is the parathyroid gland. For many years, ever since the work of McCallum and Voegtlin on calcium metabolism, much has been done in an experimental way with the parathyroids, and yet, only a very few years ago, the *Journal of the American Medical Association* published an account in which the parathyroids were relegated to the far background in their effects, so far as we knew them, on the human organism. We did know that in the old complete thyroidectomies the parathyroids were also removed and tetany universally resulted. In all experimental animals this took place except in some of the *ungulata*. It was supposed that this was because they did not eat meat. But more acute observers, investigating the matter, found that in these *ungulata* the parathyroids were not imbedded in thyroid tissue, but were separately placed. Thyroidectomy did not remove them and hence our first glimpse into their effect on bodily economy was vouchsafed. They had a function which prevented tetanic contractions. Later McCallum and Voegtlin gave us the picture of the rela-

tionship of calcium to muscular sensitiveness and irritability, and of its mobilization to the activity of the parathyroid glands. Since then, Chiari and Froehlich have also demonstrated the hyper-irritability of the entire nervous system in calcium deficiency. Since that time we clinicians have been endeavoring to apply this knowledge to our work. In the past decade we have examined many cases that showed deficiency in blood calcium. The larger number never exhibited entire tetany or other muscular spasmodic phenomena. But they did show other symptoms of a most interesting character. They usually came because of inordinate fatigability, irritability of temper and at times even of incorrigibility, non-amenability to discipline, and assaultiveness; they were easily aroused to a high pitch of anger at the slightest provocation—a word, an insinuation or even a glance being sufficient to arouse intense antagonistic reaction. These patients became problem cases at home, at school or in whatever environment they found themselves, because of their non-adaptability and uncompromising attitude. Occasionally their behavior became so exaggerated that apparently hypomanic states developed therefrom, and several of these patients had to be confined in institutions until the symptoms were ameliorated. At home, a harsh word from any member of the family, at the table for instance, would result in a plate or knife or some other utensil being thrown at the aggressor. In school, a blow, a shout or a curse would be hurled at a fellow student, or even at the teacher. Because these patients seemed to me to have many points in common, such as stature, bodily features and biochemical conditions, it seemed important to determine whether they formed an actual group which could be differentiated by certain stigmas, in both the physical and the biochemical domains. I have collected the reports of a representative group of such cases and have arranged and classified the observations to bring out some of the common correlated features.

Practically all the cases, in both children and adults, showed the physical signs of myotatic irritability and

myoidema, some to a greater degree than others. In some, the myotatic irritability would be increased to such a point that a Chvostek reaction of moderate degree was obtained. The unanimity with which myotatic irritability was found in this entire group of cases is striking. The converse, however, that all patients with myotatic irritability and myoidema have the behavioristic qualities shown by patients in this group is not true to the same extent, but the attributes are nevertheless sufficiently prevalent to awaken suspicions of conduct disorders whenever these physical signs are evoked. The best site for eliciting both myotatic irritability and myoidema is at the shoulder over the deltoid and pectoral muscles.

Because of the correlation between muscle irritability and non-utilization of calcium, I next undertook the examination of the calcium content of the blood. In our laboratory examination, the calcium content of the whole blood is determined—not merely that of the serum. The normal values are from 6.5 to 9.5 mg. per hundred cubic centimetres of whole blood. From the tables it will be seen that nineteen of twenty-three cases showed deficient blood calcium, varying from 5 to 8 mg. per hundred cubic centimetres. The four cases that showed an apparently normal blood calcium are of interest for the reason that treatment was just as efficient in them as in the other nineteen cases that showed deficient blood calcium. This led me to suppose that it was not so much the presence of calcium in the blood that determines the disturbances as it was the *utilization* of calcium which under treatment seemed generally to be increased. It is curious to note that in many of the cases in which a low calcium content was observed in the blood, there was an increased deposit of calcium in various portions of the body producing thick skull tables, and particularly that there were calcium deposits in the pineal gland.

It is interesting to note that of nineteen cases in which the skull was examined with the X-ray, fourteen showed a pineal shadow in spite of the fact that the patients in all

were sixteen years of age or less—a comparatively rare observation. Whether the pineal calcification is merely a part of the calcium metabolic disturbance in the patient or whether it represents a pineal involutional process is difficult to say. If it represents a pineal involutional process, one would expect to find some structural or metabolic effect. As a matter of fact, in five of my cases in which a pineal shadow was shown, there were such symptoms as enlarged clitoris and breasts (one case) pubertas praecox (one case) and enlarged genitals in boys (three cases). In several others, psychosexual precocity was pronounced. Whether or not the pineal effect on muscular activity, as has been said, is a fact, it is interesting to note that a large percentage of my cases showed intense muscular fatigability in spite of an increased blood sugar and increased blood pressure.

The next interesting observation in these cases pertains to growth in length. Of nineteen cases, six of the children were of normal height, four were between 2 and 4 inches (5.08 and 10.16 cm.) below average height for age, and nine were 4 inches (10.16 cm.) or more below the average height for age; these figures show a tendency toward dwarfism. When one realizes that the utilization of calcium is deficient, one can readily understand how part of non-utilization might readily have affected the growth of the long bones.

Running in inverse proportion to the calcium is the sugar content of the blood. Only two of my patients had a sugar content below 100 mg. per cubic centimetre; the blood sugar of twelve being between 110 and 140 and this occurred in subjects under sixteen years of age. A low calcium content in combination with a high content of sugar in the blood has been noted by some observers in some types of diabetes, although in none of my patients was glycosuria present.

Although the patients whose cases are here used as illustrations were sixteen years of age or under, fourteen of seventeen had a blood pressure above 100, ten above 110

and five about 120; one girl, eleven years of age, had a systolic pressure of 140. The high content of sugar in the blood and the high blood pressures are possibly secondary to sympathetic disturbance, involving perhaps also the suprarenal or the pituitary glands. Indeed, with the rather high sugar mobilization, both suprarenal and pituitary glands in relation to the sympathetic might well be considered in connection with the comparatively high tension.

All of the cases were classified on the one basis of behavioristic qualities. As already stated, these varied from the simply incorrigible and quarrelsome ones to those performing assaultiveness and exhibiting the most violent temper, reaching the point of hypomanic disturbance. Whether these behavioristic qualities are due to defect in the utilization of calcium or to some other factors that have been discussed, is a moot point. It seems to me, however, not only because the low utilization of calcium is the most constant factor, but also because of the effect of non-utilization of calcium on the muscular system, that the behavioristic anomalies may belong to the same category, depending on the non-utilization of calcium by the vegetative nervous system. It has been shown by a number of previous investigators that diminution in the supply of calcium to the blood results in increased reaction of nerve tissue to an induction current. It is possible that the same factors that bring about myotatic irritability in the muscle, also bring about untoward reactions in the nervous system. That is to say, reaction follows stimulus so rapidly that the overt act is committed before reason and judgment can come into play for purposes of inhibition.

This speed of nerve reaction is perhaps also the basis for the wit and precocity shown by these persons—a property which they all possess.

For the most part, not only are these patients remarkably witty and precocious in replies and reactions, but they are, in the main, intelligent as well. Theirs is not the

incurrigibility and bad-temperedness of the moron and the defective, for on psychometric test in all of my cases only one subject showed an intelligence below normal. Indeed, in school these children were among the brightest and highest in scholastic standing.

The high blood sugar values, the assaultiveness, the speed of reaction time, the high blood pressures, all point to a sympathetic activity above the normal. That is to say, absence or rather diminution of parathyroid activity is consonant with increased sympathetic tone; normal parathyroid secretion corrects this and is therefore probably among the vagotonic group or parasympathetic stimulants. This curious juxtaposition of thyroid and parathyroid anatomically, with reverse effects on the vegetative nervous system is frequently met with in the glandular system—witness the cortex and medulla of the suprarenals and the anterior and posterior lobes of the pituitary.

With these examples presented to you of the intricate correlations between some of the glandular elements and the division of the vegetative nervous system and the disease pictures produced by their disturbances, I trust that my function this evening has been of sufficient interest to you to stimulate further research and inquiry into the past histories of those of your patients whose complaints have only partially been understood and evaluated, with the purpose of determining a kinetic rather than a static viewpoint of the causation of many human ills.

LEGAL STATUS OF HOSPITAL RECORDS

The Neurological Institute asked the opinion of the Academy on the status of hospital records. A series of questions were formulated by the Neurological Institute and in view of its wider experience the questions were forwarded to the American Medical Association.

The questions and the answers of the Bureau of Legal Medicine and Legislation of the American Medical Association are as follows:*

1. *How much of the clinical record on ward patients is subject to subpoena by the courts?* Answer.—I know of no basis for drawing a distinction between the right of the courts to subpoena the clinical records of ward patients and the right of the courts to subpoena clinical records of private patients. The record of either class may be subpoenaed so far as such records are material and pertinent to the issues before the court. Probably this is true with respect even to records covered by the statutes forbidding the introduction of privileged communications in evidence, even though such records *could not be admitted in evidence after they had been produced in court in response to the subpoena*. In any event, it would be unwise for an officer of a hospital served with a subpoena commanding him to produce the records in any case to decline to respond to that subpoena and to produce the records, unless he was willing to assume the burden of determining whether such records were or were not admissible and contesting the issue, if he should be adjudged in contempt, by habeas corpus proceedings and appeals to the higher courts. The proper course, in such a case, it seems to me, would be to produce the records and leave the judge to determine whether they are or are not admissible.

2. *Are any of the records contained in the chart of the patient considered as given in confidence, and is such confidence protected by the courts?* Answer.—It may be stated as a general rule that where the information recorded on a chart represents a privileged communication between the physician and the patient, within the meaning of the statute governing privileged communications in the jurisdiction where the question arises, and if the patient has not expressly or by implication waived his privilege of secrecy, the record will to that extent be regarded as privileged.

3. *Are the records of private patients considered to be the property of the private physician taking care of them in the hospital, or are the records considered to be the property of the hospital?* Answer.—So far as I know, no court has passed on the ownership of the clinical records of hospital patients, either of private patients or of any other class. The matter of ownership might be governed by express agreement in any particular case,

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provided the agreement was entered into before the patient entered the hospital. In the absence of an express agreement it is presumably governed by the rules of the hospital; a patient entering a hospital and a physician undertaking to treat a patient in a hospital may be presumed to agree to abide by such rules when they enter the hospital premises. In the absence of an express agreement and of hospital rules, the courts would probably follow the established universal or near-universal custom with respect to the matter. That custom would, it seems to me, constitute the hospital as owner of such records *as trustees for the benefit of the patient*. I am by no means sure that the attending physician has any right in the records after he has discontinued attendance on the patient, unless there is some express agreement giving him that right.

4. *What parts of these records are considered to be given in confidence and therefore not subject to legal review or to be used in evidence?* Answer.—Just what is intended by the phrase “legal review or to be used in evidence,” is not clear. The extent to which the recorded data are protected from disclosure in court depends on the law governing privileged communications in the jurisdiction where an effort is being made to compel such disclosure.

This, of course, is a question somewhat different from the use of hospital records in evidence, a matter that involves questions of hearsay, authentication, etc., that can hardly be discussed satisfactorily within the compass of a letter.

5. *Are x-ray films taken of private patients considered to be a part of the hospital record, or are they the property of the private patients?* Answer.—Roentgenograms of hospital patients taken in the course of diagnosis and treatment in the hospital are, in my judgment, a part of the hospital records, and I can see no reason for regarding them in any other way, although I know of no court decision of any court of appellate jurisdiction bearing on this point. With respect to the ownership of such records, whether taken in a hospital or elsewhere, your attention is invited to an article in the *Journal of the American Medical Association*, June 18, 1927, 88: 1985-1986.

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London, Faber, [1929], 266 p.
- Richet, C. jr. Précis de pathologie expérimentale.
Paris, Baillière, 1929, 331 p.
- Rist, E. Qu'est-ce que la médecine?
Paris, Masson, 1929, 235 p.
- Rowntree, L. G. & Brown, G. E. The volume of the blood and plasma in health and disease.
Phila., Saunders, 1929, 219 p.
- Santenoise, D. Pneumogastrique, appareil thyroïdien et activité cérébrale.
Paris, Legrand, 1929, 336 p.
- Saupe, E. & Ehle, K. Das Thoraxröntgenbild des normalen Säuglings.
München, Lehmann, 1929, 41 p.
- Schröder, H. Über die Aufgaben der zahnärztlichen Prothetik.
Berlin, Meusser, 1929, 150 p.
- Schroff, J. Fundamentals of pathology.
N. Y., Broder, [1929], 109 p.
- Smith, C. S. & Wikoff, H. L. Practical materia medica.
Phila., Lea, 1929, 300 p.
- Somerville, H. Madness in Shakespearian tragedy.
London, Richards, [1929], 207 p.
- Synopsis of the practice of preventive medicine as applied...at Harvard Medical School.
Cambridge, Harvard Univ. Press, 1929, 194 p.
- Terrien, F. Sémiologie oculaire, statistique et dynamique oculaires.
Paris, Masson, 1928, 224 p.
- Thannhauser, S. J. Lehrbuch des Stoffwechsels und der Stoffwechselskrankheiten.
München, Bergmann, 1929, 741 p.
- Thiel, P. J. Die Augendiagnose.
2. Aufl., Leipzig, Krüger, 1929, 380 p.
- Tholuck, H. J. Die Behandlung der Milchzähne.
Berlin, Meusser, 1929, 108 p.
- Tobías, J. W. Tumores primitivos de la pleura.
Buenos Aires, El Ateneo, 1928, 479 p.
- Tredgold, A. F. Mental deficiency.
5. ed., London, Baillière, 1929, 535 p.
- Unfall-Neurose (Die) als Problem der Gegenwartsmedizin. Hrsg. von Walther Riese.
Stuttgart, Hippokrates-Verlag, 1929, 261 p.
- de Varigny, H. Mort véritable et fausse mort.
Paris, Alcan, [1929], 318 p.
- Voivenel, P. & Lagriffe, L. Sous le signe de la P. G.
5. éd., Paris, Renaissance du Livre, 1929, 256 p.
- Volhard, F. & Becher, E. Die klinischen Methoden der Nierenfunktionsprüfung.
Berlin, Urban, 1929, 308 p.

Walkhoff, O. Die Vitamine in ihrer Bedeutung für die Entwicklung...
der Zähne gegen Erkrankungen.

Berlin, Meusser, 1929, 100 p.

White, H. P. W. Stone in the urinary tract.

London, Churchill, 1929, 344 p.

Wolff, L. Keats.

3: ed., Paris, Bloud, 1929, 330 p.

AMONG OUR MANUSCRIPTS

ASSOCIATIONS OF DAVID HOSACK

This age of rush and hurry has eliminated much uninteresting but necessary labor on the part of the doctor as well as the business man. It seems incredible that only a hundred or so years ago the physician had to pause in the practice of his profession for the more simple task of writing out all his letters and lectures. But it is this fact alone that has given us many interesting documents, and we harbor no envy toward those of the future who must work on the impersonal typewritten sheets that are the manuscripts of today.

The name of David Hosack is familiar to all who have dipped into the medical history of this country. It is fitting that a library situated in the city where he was born, where he practiced and where he taught for so many years should be in possession of so much that has come from his hand, so much that cannot be duplicated. Through the kindness of a Fellow of the Academy, Dr. Alfred M. Hellman, this library has upon its shelves several manuscripts written by Dr. Hosack, his lectures on botany, on materia medica, two memorandum books, and a "List of private pupils educated in the office of D Hosack from the year 1795." The latter is prefaced by a copy of the "Regulations to be observed by the private pupils of medecine [*sic*] in the office of David Hosack," to which the names of the students are subscribed. The rules are as follows:

- 1) The Hours of attendance to be from 9 A.M. to 9 P.M. excepting the time of meals and attendance upon Lectures or the Hospital.

- 2) No gentleman will leave the city or absent himself from the office to go into the country without previously consulting his instructor excepting during the vacation in the month of August.
- 3) The duties of the office viz preparing the medecines prescribed, keeping a Register of the weather to be done in rotation.
- 4) No conversation to be held upon any other than medical subjects or such as are connected with medicine.
- 5) No Books to be read in the office but such as relate to medecine and its collateral branches.
- 6) No *Tobacco* or *Spiritous liquors* to be made use of in the office.

His lectures were written about 1804 when he was professor of materia medica at Columbia. His memorandum books cover a longer period of time. The earlier one, started in 1795, contains his accounts. The other, dating from about 1811, consists of notations on medical subjects, which he jotted down whenever he found something he felt of unusual interest. These continue up to the year of his death, 1835.

From another source has come a manuscript, not written by Dr. Hosack, but full of interesting and personal material. This is a well thumbed folio in which his letters have been copied, perhaps by some of his students, perhaps by members of his family, sometimes dashed off in a most undecipherable hand, sometimes painstakingly entered by a firm round hand, and occasionally corrected in the hand of Dr. Hosack. The greater part of the correspondence is on the subject of yellow fever. It was at this time that he was editing the *Medical and Philosophical Register*, and many letters were sent to doctors in this country, the West Indies, and other places which had witnessed the ravages of fever epidemics, in order that their opinions might be included in the material for this publication. These letters were sent to such men as Samuel Bard, William Currie, Colin Chisholm, Timothy Dwight and Noah Webster. The Elgin Botanic Garden which he had founded, formed the subject of a number of other letters. Dr. Hosack, desiring to make a disposal of this property to the State, found that "a vile attempt has been made by

Dr. [Nickolaus] Romeyne to defeat my application." It was six months before he could overcome this opposition. From one letter we find that it is to Dr. Hosack that we are indebted for Sully's familiar portrait of Dr. Benjamin Rush, sitting at his desk, his glasses pushed well back on his forehead, his right hand resting on an open book. Dr. Hosack wrote to Sully, asking him to paint the portrait, in April, 1812, just a year before Dr. Rush's death. The painting was soon begun, but evidently the artist did not agree with Dr. Hosack that it would be improved by "throwing into the background a distant view of your city [Philadelphia] Hospital or University to which Dr. Rush's labours have been so much devoted." Later, however, engraved copies appeared in which Dr. Hosack's advice has been taken, for we find in some of these that the background of his study has been ignored by the engraver who has substituted the "distant view" of the Pennsylvania Hospital. How Sully felt about it was another matter. A few months after Dr. Rush's death Hosack wrote to his son, Richard Rush, that he would send him "by the first private conveyance a proof impression of an engraving made from the original portrait in my possession—that done in Philadelphia is by no means well done—Sully is mortified at it after seeing mine." Another letter of interest is that addressed to Dr. Alyre Raffeneau Delile, April 9, 1808, describing the operation for which Dr. Hosack is so well known, that of tying the femoral artery for aneurism. The operation was performed just nine days before this was written. The many letters of introduction which we find in this volume indicate the varied extent of his friends on both sides of the water: Washington Irving, Benjamin Smith Barton, Wright Post, on this side; John Bostock, Sir James Edward Smith, John Coakley Lettsom and others of England. Then, too, we find among his patients many people of note. It is interesting to see that Dr. Hosack, the surgeon who was in attendance at the Burr-Hamilton duel, kept up his friendship with the Burr family, for in 1808 we find him writing most cordial letters to Joseph Alston and his wife, Theodosia

Burr. There are over a hundred letters in all, few of which are directed to any but well known and important people. We are grateful indeed for such a glimpse into the life of this active and much respected gentleman.

GERTRUDE L. ANNAN.

PROCEEDINGS OF ACADEMY MEETINGS

DECEMBER

STATED MEETINGS

Thursday Evening, December 5, at 8:30 o'clock

Program presented in cooperation with the Sections of Surgery and Medicine.

ORDER

I. EXECUTIVE SESSION

- a. Election of officers
- b. Vote on proposed amendments to Constitution and By-laws
- c. Supplementary report of Nominating Committee
- d. Nomination of Honorary Fellows
- e. Election of Fellows

II. PAPERS OF THE EVENING

- a. The treatment of peptic ulcer, Thomas R. Brown, Baltimore (by invitation)
- b. Ulcers of the duodenum and stomach, Frank Lahey, Boston (by invitation)

III. Discussion

Dudley Roberts, Mills Sturtevant, Hermann Fischer, Fordyce B. St. John

Thursday Evening, December 19, at 8:30 o'clock

THE THIRD HARVEY LECTURE

Some phases of the filterable virus problem, Ernest W. Goodpasture, Professor of Pathology, Vanderbilt University School of Medicine.

G. CANBY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for December.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, December 3, at 7:45 o'clock

ORDER

- I. PRESENTATION OF PATIENTS
 - a. Cases from the Mt. Sinai Hospital
 - b. Cases from the Good Samaritan Dispensary
- II. MISCELLANEOUS CASES
- III. DISCUSSION OF CASES
- IV. EXECUTIVE SESSION

NOTE: Examination of cases is limited to members and their invited guests

SECTION OF NEUROLOGY AND PSYCHIATRY

Monday Evening, December 9, at 8:30 o'clock

(Please note change in date)

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. Narcolepsy associated with chronic encephalitis, Walter Bromberg (by invitation)
 - b. A discussion of some errors in the diagnosis of schizophrenia, C. Macfie Campbell (by invitation)

Discussion, Henri Claude, Paris (by invitation), Ernst Kretschmer, Marburg (by invitation), David K. Henderson, Glasgow (by invitation), Walther Spielmeier, Munich (by invitation), Constantin von Economo, Vienna (by invitation)

 - c. Some observations on recent advances in psychiatry with special reference to schizophrenia, Eugen Bleuler, Zurich, Switzerland (by invitation)

Discussion, Henri Claude, Paris (by invitation), Ernst Kretschmer, Marburg (by invitation), David K. Henderson, Glasgow (by invitation), Walther Spielmeier, Munich (by invitation), Constantin von Economo, Vienna (by invitation)
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, December 12, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Blood volume studies in dehydration, Rustin McIntosh, Baltimore
 - b. Cause of the acidosis associated with diarrhoea, L. Emmett Holt, jr., Baltimore (by invitation)

- c. Treatment of anemia in infancy, Hugh Josephs, Baltimore (by invitation)
- d. Changes in serum electrolytes in rickets, Bengt Hamilton, Baltimore (by invitation)
- e. Earliest anatomical change in rickets, Edwards A. Park, Baltimore (by invitation)
- Discussion, Oscar M. Schloss, Martha Wollstein, Benjamin Kramer, Alwin M. Pappenheimer

SECTION OF OTOTOLOGY

Friday Evening, December 13, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF SPECIMENS
- III. CASE REPORTS
- IV. PAPERS OF THE EVENING
 - a. The physiology and clinical examination of the labyrinth. Lantern slides, J. D. Whitham (by invitation)
 - b. The clinical pathology of mastoiditis with special reference to bacteremia and blood transfusions, A. A. Eggston
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, December 16, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
- III. DEMONSTRATIONS
 - a. 1. Implantation cysts
 - 2. Myopic crescents with associated choriovascular veins (lantern slides), Louise H. Meeker (by invitation)
 - b. Aids to ophthalmoscopy, Algernon B. Reese
- IV. PAPERS OF THE EVENING
 - a. Ocular movements, Cornelis D. Verrijp, Leyden, Holland (by invitation)
 - b. The vision of preschool children. An analytical study of 982 children by the National Society for the Prevention of Blindness (lantern slides) B. Franklin Royer (by invitation)
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, December 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION BY POST-GRADUATE HOSPITAL UROLOGICAL STAFF
 - a. An interesting case of renal tumor, J. Sidney Ritter
 - b. A clinico-anatomical study of the vesical neck, Joseph A. Hyams, Samuel E. Kramer (by invitation)
 - c. Factors influencing motility of spermatozoa in semen, C. Travers Stepita, John A. Killian, Ph.D. (by invitation)
 - d. Solitary cyst of kidney with resection, George F. Cahill
 - e. Vesical neck obstruction with large vesical calculus. Bilateral hydroureters with hydronephrosis, double left kidney and ureter, Clarence G. Bandler, Joseph A. Hyams
 - f. Functional end results in renal injury, Stanley R. Woodruff
 - g. Hemi-nephrectomy in pyonephrotic horseshoe kidney, Joseph F. McCarthy
- III. GENERAL DISCUSSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, December 20, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Contractions of the hand, Sumner L. Koch, Chacigo (by invitation)
Discussion to be opened by Hugh Auchincloss
- III. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Friday Evening, December 20, at 8:30 o'clock

(Please note change in date and time)

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
Subject: Vaso-motor disturbances in rhinology
 - a. Allergy in rhinology, Robert A. Cooke
Discussion, Alexander C. Howe
 - b. Relation of sinus disease to vaso-motor disturbances, Lee M. Hurd
 - c. Diagnosis of vaso-motor disturbances of the nose, Louis Hubert
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Thursday Evening, December 26, at 8:30 o'clock
(Please note change in date)

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
Laparo-trachelotomy
A motion picture in 8 reels with movietone, Joseph B. DeLee, Chicago (by invitation), Edwin G. Langrock introduced M. Edward Davis, Chicago (by invitation)
Discussion, Frederick C. Holden, I. C. Rubin
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

NEW YORK MEETING OF THE
SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday Evening, December 18, at 8:15 o'clock

- I. Utilization of fat by resting and exercising muscles of diabetic dogs, H. E. Himwich, H. Friedman, E. Berry, W. H. Chambers
- II. The so-called hyperglycemic action of insulin, I. Neuwirth, F. CoTui, G. B. Wallace
- III. Influence of acid and base-forming feeding on growth, E. L. Samuel, I. N. Kugelmass
- IV. Effect of division of dorsal roots of cervical nerves upon diaphragmatic respiratory movements, H. C. Coombs
- V. A method for determining the chill producing properties of anti-pneumococci serum, A. B. Sabin, G. B. Wallace

NEW YORK PATHOLOGICAL SOCIETY
in affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Monday Evening, December 23, at 8:30 o'clock
(Please note change in date)

ORDER

- I. PAPERS OF THE EVENING
 - a. Adeno-fibro-sarcoma of the breast, Lawrence Sophian (by invitation)
 - b. Cellular fibroma of the pleura, Angelo M. Sala
 - c. Aneurysm of the bronchial artery, Angelo M. Sala, Mendel Jacobi
 - d. Aneurysm of aorta rupturing into superior vena cava, Lawrence H. Cotter
 - e. Anomalous ramifications of the coronary artery, William A. Antopol, M. A. Kugel
 - f. A case of Schilder's encephalitis, L. W. Smith, I. Scheffer (by invitation)
- II. EXECUTIVE SESSION

HONORARY FELLOWS ELECTED JANUARY 2, 1930

Russell Henry Chittenden..	Emeritus Professor of Physiological Chemistry Yale University
Jules Bordet....	Professor of Bacteriology, Parasitology and Epidemiology Brussels University
Sir Thomas Lewis.....	Physician, University College Hospital, London
Ernst Fuchs....	Emeritus Professor of Ophthalmology, University of Vienna
Sir Frederick Gowland Hopkins.....	Professor of Biochemistry University of Cambridge
Madame Marie Curie.....	Director of Laboratory of General Physics and Radioactivity, Radium Institute, Paris
René Leriche.....	Professor of Clinical Surgery, Faculty of Medicine University of Strassbourg

FELLOWS ELECTED JANUARY 2, 1930

Richard M. Brickner.....	123 West 74th Street
Thomas Wood Clarke.....	7 Cottage Pl., Utica, N. Y.
Charles Davison.....	Montefiore Hospital
Botho F. Felden.....	216 West 89th Street
Robert Cockburn Fisher, 2nd.....	243 East 36th Street
Harry Gold.....	2387 Creston Avenue
James Francis Grattan.....	30 West 59th Street
Martin Lewis Janes.....	330 West 72nd Street
Scott Johnson.....	59 East 77th Street
S. Edward King.....	105 East 63rd Street
Meyer J. Kutisker.....	152 East 35th Street
Peter Lavalle.....	241 West 4th Street
Morris Leff.....	15 East 111th Street
Hubert A. Lyons.....	32 East 65th Street
David A. Newman.....	1325 Grand Concourse
Harry Allen Durfee O'Connor.....	216 East 50th Street
Walter L. Pannell.....	25 Prospect Street, East Orange, N. J.
Jean Harwood Pattison.....	120 East 75th Street
David Perla.....	Montefiore Hospital
Edward C. Reifstein.....	713 East Genesee Street, Syracuse, N. Y.
Lawrence Weld Smith.....	477 First Avenue
Albert Mason Stevens.....	55 East 76th Street
Harold Julian Stewart.....	Rockefeller Institute
Spencer Goldsmith Strauss.....	912 Fifth Avenue
Morris Weissberg.....	1101 Bushwick Ave., Brooklyn

ASSOCIATE FELLOWS ELECTED JANUARY 2, 1930

Walter Gregory Bowerman, A.B.....	199 Glenwood Avenue, Leonia, N. J.
Malcolm W. Carr, D.D.S.....	667 Madison Avenue

A BEQUEST DECLINED

At a recent meeting of the Council it was reported that under the will of a former Fellow, the Academy was bequeathed a number of shares in an industrial company to create a special named fund, "Whose net income shall be paid every two years to the physician who shall have made the greatest advance in that period in the field of ——— work and research in the judgment of the Committee of this fund, which the said Academy may appoint. This Committee shall have the power to decide whether essays shall be submitted and make all directions in regard hereto. I make it a condition in connection with this bequest, that my nephew, (a Fellow of the Academy) shall for his life be chairman of said Committee and shall receive in compensation for his services annually 10% of the income of said fund."

The Council and Trustees were unanimous in declining this bequest and for the following reason :

That the membership of the Committee and the full control does not rest with the governing body of the Academy. The Chairman of the Committee is stipulated in advance and part of the income of the fund is to be paid to the Chairman for life.

This is the fifth specific bequest or gift that has been declined by the Academy during the past four years for similar reasons.

It is suggested again that if Fellows or other friends plan to leave a bequest to the Academy, they should consult with a Trustee or officer of the Academy before reaching a final decision.

DEATHS OF FELLOWS OF THE ACADEMY

CYRIL BARNETT, M.D., 1123 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1904; elected a Fellow of the Academy, October 4, 1928; died, January 8, 1930. Dr. Barnett was a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of Mt. Sinai Hospital, a member of the Society of Alumni of Lebanon Hospital, Associate Ophthalmic Surgeon to Lebanon and Mt. Sinai Hospitals and Consulting Ophthalmologist to Barnett Memorial and Beth Israel Hospitals, Passaic, New Jersey.

ERNST DANZIGER, M.D., 285 Central Park West, New York City; graduated in medicine from New York University, New York City, in 1894; elected a Fellow of the Academy, February 6, 1908; died, January 7, 1930. Dr. Danziger was a Fellow of the American Medical Association and a member of the County and State Medical Societies. He was Oto-Laryngologist to Sydenham Hospital, Consulting Oto-Laryngologist to Montefiore and Lenox Hill Hospitals, Out Patient Department.

CLARENCE FLOYD HAVILAND, M.D., Manhattan State Hospital, Welfare Island, New York; graduated in medicine from Syracuse University, Syracuse, New York, in 1896; elected a Fellow of the Academy, April 19, 1928; died, January 1, 1930. Dr. Haviland was a Fellow of the American Medical Association. He was also a member of the County and State Medical Societies, a member of the American Psychiatric Society, a member of the American Psychopathic Society, a member of the Psychiatric Society of New York, a member of the Neurological Society of New York, and a member of the Clinical Psychiatric Society. He was Superintendent of the Manhattan State Hospital.

FRANK CANFIELD HOLLISTER, M.D., 264 West 77th Street, New York City; graduated in medicine from the Bellevue Hospital Medical College, New York City, in 1890; elected a Fellow of the Academy May 15, 1902; died, November 30, 1929. Dr. Hollister was a Fellow of the American Medical Association, a member of the County and State Medical Societies, and the Society of Alumni of Bellevue Hospital, Physician to St. Elizabeth's Hospital and Consulting Physician to Good Samaritan Hospital, Suffern, N. Y.

ELLIOTT NORTON, M.D., 405 Park Avenue, New York City; graduated in medicine from the New York Homoeopathic Medical College and Flower Hospital, New York City, in 1916; elected a Fellow of the Academy May 17, 1928; died, August 2, 1929. Dr. Norton was a Fellow of the American Medical Association, a member of the County and State Medical Societies and a member of the Pathological Society. He was Surgeon of Ophthalmology to Fifth Avenue Hospital and Associate Ophthalmologist to Poly-clinic Medical School and Hospital.

JOHN EASTMAN WILSON, M.D., 114 East 54 Street, New York City; graduated in medicine from the New York Homoeopathic Medical College and Flower Hospital, New York City, in 1883; elected a Fellow of the Academy October 7, 1920; died, December 19, 1929. Dr. Wilson was a member of the American Institute of Homoeopathy, and the Homoeopathic Medical Society of New York. He was Consulting Neurologist to Fifth Avenue, Broad Street and Middletown State Hospitals, New York; Neurologist to the Homoeopathic and Maternity Hospitals, Yonkers, and Ann May Memorial, Spring Lake.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VI

FEBRUARY, 1930

NO. 2

ANNUAL GRADUATE FORTNIGHT

*Functional and Nervous Problems
in Medicine and Surgery
October 7 to 19, 1929*

HEADACHE AND MIGRAINE *

FREDERICK TILNEY

Professor of Neurology, Columbia University

The Post-Graduate Fortnight has established the custom of assigning subjects to its contributors. Last year I was asked to speak on "The Ageing of the Human Brain." After reviewing much material, I came to the tentative conclusion that the aged brain is more the result of disease than of time; that it is in the strict sense a symptom of extensive pathological change accumulated during the course of a greater or less number of years.

This year I do not hesitate to draw a thoroughly positive conclusion. Headache is a symptom. From the clinical standpoint it must be regarded in this light. In fact, I wish at the outset to emphasize this point of view and especially to stress the importance of regarding this symptom as an indication of disease which demands the most thorough diagnostic investigation before its treatment may be approached.

Headache, in every aspect, is a challenge. Many are they who, in all times, have gone out to meet it. In order to gain some idea of the proportions of the attack already made upon this prevalent symptom, I had collected for me

* Delivered October 11, 1929.

during the past summer a vast number of references on the subject of headache in medical literature. The volume of effort and thought which this bibliography represents is surprising. More surprising still is the fact that nearly every part of the human anatomy has been incriminated as the arch offender in headache. The gamut runs from ovary to pituitary, from flat feet to eye-strain. Offending material agencies outside of the body, like war, alcohol, nicotine and every variety of food, come in for their specific reproaches as causative elements. Certain extracorporeal, immaterial factors, such as the psyche, are made to bear their special burdens in the explanation of psychogenic and psychoneurotic headaches.

All of this assortment of theories cannot fail to produce a sense of confusion. It may be well that we realize our confused state of mind in this matter. We may then draw the true boundaries between the limits of our knowledge and what we accept as traditional dogma. At the center of this confusion is a fundamental defect. We do not yet know the nature or mechanism of pain. In a recent study on "The Basis of Sensation," Adrian has this to say: "Whatever our views about the relation of mind and body, we cannot escape the fact that there is an unsatisfactory gap between two such events as sticking a pin in my finger and the sensation of pain appearing in my consciousness. Part of the gap is obviously made up of events in my sensory nerves and brain, and the psychological method by itself can tell us nothing at all about these events."

Thus we are left as much in the dark concerning the ultimate nature of headache as were our first predecessors who encountered and endeavored to solve its problem. Yet, almost unthinkingly, we give assent to the two generally accepted classes of headache. We believe them to be explanatory. The first class is called intracranial headache, and the second, extracranial headache.

On closer scrutiny, this classification leaves almost everything at the depths of the problem still untouched. It is our general conception that anything producing intra-

cranial pressure will give rise to headache. This condition we recognize in connection with edema in the brain and hyperemia caused by various toxins, by acute infections, by drugs. The pressure may also be more directly material as in the case of tumors, hemorrhages or abscesses within the brain tissue.

In explaining the exact operation of such pressure within the skull we encounter our first stumbling-block. For a long time it has been known that the brain tissue itself is insensitive. On this account an adequate sensory mechanism for the transmission of pain appears to be wanting. In explaining this apparent contradiction it is customary to lay the blame upon the dura mater which, being supplied by sensory nerves from the fifth, ninth and tenth cranial nerves, is adequate for the conveyance of painful stimuli arising from dural sources. It is probable, on the other hand, that this explanation is insufficient in the vast majority of cases. To accept it as proved is prejudicial to our further understanding of pain within the head. Many circumstances point away from this simplistic explanation. Among the most telling facts against this view are those brought forward by one of our most distinguished brain surgeons. In his presidential address delivered at the meeting of the Association for Research in Nervous and Mental Disease, in 1927, Dr. Charles A. Elsberg says—"The ordinary 'headache' that occurs in many diseases, in disturbance of the gastro-intestinal tract, in fever, and in states of increased intracranial pressure, is usually described as due to distension or stretching of the dura, with pressure of that membrane against the inner surface of the cranial bones." He then points out that headache often occurs in states of diminished intracranial pressure, in anemia, and in conditions in which the total blood volume and general blood pressure are diminished, all of which casts serious doubt about its dural origin. His further observations in relation to this matter are of great significance.

For many years of observation during the course of cranial operations performed under local anesthesia, he

is convinced—as others have been—that with exception of the meningeal vessels, the dura is insensitive. The dura can be stretched and pulled, it can be distended to the maximum in all directions without causing any pain or headache.

If, on the other hand, intraventricular pressure is suddenly lowered or raised by the removal of fluid or by the injection of fluid or air, typical headache is at once produced. In some instances in which the fluid was withdrawn from or injected into a frontal horn, the headache was located in the frontal region, and if the procedure was done in a posterior horn, the headache was occipital.

Furthermore, if gentle but gradually increasing pressure is made in the occipital region of a patient on whom a suboccipital craniotomy has previously been performed, a frontal headache is often determined which may last for one or several hours.

Whatever may be the real significance of the facts, they do seem to indicate that distension and stretching of the dura have little if anything to do with headache, but that sudden changes in intraventricular and perhaps intracranial pressure may have an important bearing upon the etiology of at least some varieties of headache.

This interpretation of headache introduces all of the complex possibilities related to the secretion, absorption and circulation of the cerebrospinal fluid. Of late years our growing clinical experience with manometric estimations of the spinal fluid have produced many striking characteristics revealing the close relation between blood pressure, and more particularly venous blood pressure, and cerebrospinal pressure. A remarkable instance of this intimate relation has recently been supplied by experiments under Dr. Elsberg's direction. The performance of the ordinary manometric estimation of the spinal fluid has been carried on in two patients each of whom received at the time of puncture one pearl of amyl nitrate by inhalation. The pressure in the manometer, which prior

to this inhalation had risen to the normal height, immediately and rapidly fell to zero. The patients, as is the rule on amyl nitrate inhalation, complained of a severe though transitory frontal headache.

Surgical experience has now so amply discredited the theory that pain arises exclusively from pressure or stimulation of the dura mater, from manipulation or operation upon the bones of the skull, that it is necessary to turn to some other explanation in order to understand the nature of headache. It is probably true that in a limited number of instances, irritation of the dura may and does produce the pain symptom. This has been found to be true in patients operated upon under local anesthesia for brain tumors when gentle pressure upon the dura at the base of the skull in the neighborhood of the optic foramen, produces pain in the region of the orbit of the side stimulated.

With the dural origin of headache thus seriously called in question, it is scarcely more satisfactory to consider such pain to be the result of endocrine disorders, of sympathetic crises, with sympathicotonia, or paralysis of the sympathetic system, of abnormal narrowness of the foramen of Monro, of dilatation of the blood vessels, or angioneurotic edema, or of disorders in the medulla giving rise to neuralgic conditions in the meningeal branches of the vagal, glossopharyngeal or trigeminal nerves. All of these factors may play some part in the process of producing headaches. But none of them offers a complete or satisfying explanation.

We are a long way from anything approaching an adequate understanding of the exact nature and mechanism of headache. Nevertheless, this condition is constantly with us either as a visitant causing personal distress, or as a practical issue to be met in our patients.

For this reason we find ourselves engaged in that field where perforce so much of our work is carried on—empiricism. There, in spite of our limitations, we are compelled to seek relief for those who suffer. It is necessary,

therefore, to have some practical working program for the treatment of headache, to which end an important principle may be laid down at once. Any acceptable program of this kind will insist that diagnosis is the first step in treatment; for treatment without a proper diagnosis is as dangerous as diagnosis without treatment is futile. This fact brings us back again to the essential recognition that headache is a symptom. It is a symptom of many widely different disorders. To treat it by itself, controverts all the rules of modern medicine. It may be the presenting symptom, but it seldom if ever is the only symptom. It must be put in its proper relations in the symptom complex of which it forms a part. It must be given its correlative value in connection with all of the evidence indicative of disease. There may be reasons, based on economy or psychological effect, justifying intuitive diagnosis, but the casual acceptance of headache as a symptom sufficient to warrant the establishment of treatment without further evidence, is hazardous and in every way deplorable. Every case with this complaint deserves as complete an examination as possible. Thoroughness of the diagnostic procedure differs with the training and disposition of the individual physician. What may satisfy one will be thoroughly unsatisfactory to another. What some consider essential routine investigation, others regard as unnecessary and expensive ceremony. It can hardly be disputed, however, that with a symptom connected with such a multitude of disorders, only a complete initial diagnostic investigation is satisfactory in the long run. This course would do much to obviate what all too often proves to be the case, namely, the migratory excursions of the patient from one possible source of relief to another, which in the end is little economy to the patient and less credit to medicine.

In the practical management of such situations, one man's formula is as good as another's. I may be privileged, therefore, to say that it is my practice in every case of this kind to make a complete diagnostic study requiring hospitalization lasting from three days to one week. This

study of the patient aims to cover every possible focus of disorder which the symptom headache may suggest.

A thorough neurological examination is the first essential. By this means suggestive slight differences in the reflexes on the two sides may appear, inequalities of the pupils, alterations in sensation, changes in visual acuity, alterations in the eye-grounds, changes in personality, intellect and memory, alterations in speech, perversions in behavior, disturbances in locomotion, which, taken in conjunction with the headache, point specifically to disease involving the central nervous system and particularly the brain.

The absence of symptoms arising in connection with this examination tends to exclude the central nervous system from the final diagnostic opinion. It does not do so entirely, however, inasmuch as tumor of the brain, abscess of the brain, and certain of the more insidious infections such as syphilis, may be present without manifesting convincing signs of nervous involvement. Often the headache of brain abscess may be the most, and perhaps the only, conspicuous symptom. Its severe, more or less continuous character, usually located in some definite region of the head, and especially in connection with an active otitic, nasal or sinus process, should hold attention to the possibility of brain abscess and keep the patient available for repeated examinations and immediate operation when the diagnosis becomes clear. I know of no condition calling for such vigilance as the intense, nearly continuous, expanding headache seen in brain abscess, and often seen with but few other confirmatory signs. The headache of brain tumor may be similarly severe. It may have periods of remission and increasing intensity sufficient to stupefy the patient. This is particularly true of infiltrating neoplasms into which there may occur from time to time more or less extensive hemorrhage, or about which there is a varying degree of edematous change.

The treatment for the relief of both brain tumor and brain abscess is first a diagnosis of localization, and surgi-

cal relief as soon thereafter as possible. Unlocalizable brain abscesses and brain tumors warrant exploratory surgery. It may be necessary in some few instances to do a subtemporal decompression merely for the relief of excruciating headache. On the other hand, an exploratory approach to the tumor by such means as will expose it and make it accessible to further treatment is, in the great majority of instances, the wisest measure. An osteopathic flap fills both requirements and furnishes sufficient decompression to relieve the headache.

It may be advantageous to illustrate the steps necessary to the diagnosis process by following a particular case. In this instance, a broker, 48 years of age, who had made a considerable success of his business career. In the course of his activities he had devoted more and more of his time, both day and night, to his financial interests, and had increasingly felt the pressure of growing responsibilities. His chief complaint was severe recurrent headache, accompanied by violent attacks of projectile vomiting and periods of marked mental depression. The pain usually started over the right eye, over the right temple and in the right side of the forehead. During the course of several hours it would extend backward into the orbit and then spread over the left temple and over the entire head, becoming so intense that it incapacitated him. Transient hemianopsia was present during these attacks. It was necessary for him to give up his work and lie down quietly in a darkened room. He also suffered from a more or less constant dull aching pain in the back of his head. Usually he had some warning of the approach of the more severe headaches. He was conscious of a depressed feeling and a peculiar sensation before his eyes. He noticed that vision, on looking to the left was quite blurred and hazy. A filmy mist arose before him, such as may be seen ascending from the moist ground in summer. He became chilly and soon began to sweat. With these signs he knew that an attack was approaching. Following his headache, which lasted a number of hours, he had a distinct weakness of the entire left side of his body. His left arm and leg, while not

paralyzed, were so weak that it was impossible for him to stand or walk or use his left hand for ordinary purposes. This paralytic weakness often lasted for a day or two. Sometimes he was conscious of a distinct paralytic weakness quite independent of any headache, on which occasions it was necessary for him to use a cane in order to get about. At times also, the sensation in his left hand was defective. The hand felt numb and tingling and he did not have the proper perception of objects by means of the sense of touch. His left leg felt peculiarly unfamiliar, heavy and difficult to move. After a headache his right upper eyelid would droop, half closing his eye.

His partners had noticed an increasing irritability during the preceding two or three years. They found him excessively emotional, loud and somewhat abusive in his language, laughing more boisterously than was his custom and easily moved to tears. His wife reported similar observations and added that it was necessary to keep from him all household and domestic worries. His paralytic weakness on the left side was alarming, but more disturbing were the three or four attacks of double vision which he had, two of them following a headache and two quite independent of any head pain, but coming on with a sudden dizziness and staggering.

It must be evident that the first step in treating this man was a proper diagnosis to find out what to treat and how. Logically enough the first step was a complete neurological examination. Summarized briefly, this study showed a slight irregularity of the pupils and some sluggishness of the left pupil in reacting to light. The other reflexes were normally active with the exception of the left abdominals which were absent. Muscle strength in the left arm and leg was much decreased and a slight weakness was present in the left side of the face. It should be noted in this connection that the patient was examined the day following one of his most severe headaches. The eye-grounds showed no changes but the plotting of his visual fields indicated a distinct increase in the blind spots

of both sides. The retinal vessels were somewhat small and tortuous. The edges of the discs were slightly hazy especially on the nasal sides.

With such a history and such neurological findings the patient was distinctly a suspect for an expanding intracranial lesion, brain tumor being the most likely, but brain abscess yet to be excluded.

Sensory examination was normal with the exception of some difficulty in identifying objects by palpation in the left hand. Behavior tests showed no change in general activity. Responses were prompt and intelligent. Speech was clear, memory of recent and remote events good, power to recall and recognize within normal limits.

The suspicions created by the history and neurological examination now required support of other physical tests, especially X-ray. A complete study of the head revealed a thoroughly normal chondocranium, with no change in the basal angle, sella turcica or sphenoid processes. Due to a moderate degree of calcification the pineal gland upon stereoscopic appeared to be in its normal position, not displaced forward or backward, up or down. There was no sign of increase in the vascular channels or vascular grooves and no evidence of bone erosion in consequence of convolutional atrophy. X-ray of the sinuses showed no indication of involvement of the sphenoid, ethmoids, frontals or antra. Subsequent transillumination of the sinuses and nose, and their examination, confirmed the X-ray findings. In this way the possibility that the headache was caused by sinus infection was removed with a fair degree of assurance and expanding intracranial lesion seemed less likely. The restriction of the pain to the upper part of the head excluded a diagnosis of Sluder's "lower-half headache" in which the pain is confined to the lower part of the head and face and extends down into the neck and shoulders.

The condition of the teeth, upon X-ray, proved entirely satisfactory. There was no indication of apical or other

infections and there were no devitalized teeth. This obviated a usual and unduly popular procedure of wholesale extraction which is unfortunately too often prescribed to meet the undifferentiated condition of head pain and headache. One of my patients, who subsequently died as a result of a brain tumor, was advised in the early stages of his illness not only to have all of his perfectly sound teeth extracted, but also to have the alveolar processes curetted in order to relieve him of his severe headaches. Needless to say, the proper diagnosis in this case demonstrated the futility of such advice.

The typical manner in which the patient's headache as it developed spread from the right to the left side and was particularly pronounced in both temples, and his transient hemianopsia, suggested that he might be suffering from what is known as pituitary headache. The rest of his clinical picture was too massive to conform to this diagnosis.

Even with the X-ray evidence, the possibility of an expanding intracranial lesion could not be altogether ruled out. The blood study, repeated on three different days, showed, however, no change significant of acute infection.

Temperature by rectum every two hours showed no elevation and also no depressions below the normal. From this evidence it seemed feasible to dismiss the diagnosis of brain abscess, particularly as there was no initial infection in the throat, nose or middle ear, and also because the X-rays gave no evidence of an acute infectious process in the lung.

From facts already obtained it seemed clear that there was no expanding lesion in the posterior fossa of the brain, and so it was decided to do a lumbar puncture in order to test the serology and pressure of the cerebrospinal fluid. The patient was instructed to remain in bed for the following 48 hours in order to avoid the development of a lumbar puncture headache. Manometric test showed no increase of intracranial pressure, and the laboratory re-

ports upon the fluid, as well as upon the blood, showed that the Wassermann reaction was negative. The spinal fluid contained no cells, its globulin content was negative and its total protein 25 milligrams. The colloidal gold curve was likewise negative. These tests satisfactorily removed the possibility of syphilis as well as any acute inflammatory process involving the cerebrospinal axis.

Blood count and culture ruled out the diagnosis of primary blood disease and systemic infection. Complete cardiovascular examination made it possible to disregard arteriosclerosis as an important factor.

The eye examination was negative and went far to allay the suspicion of brain tumor. It disclosed no degree of refractive error sufficient to produce such eye-strain as is regarded an adequate cause of headache.

Urinalysis and tests for renal efficiency, as well as the blood chemistry, indicated there was no reason to suspect the kidney as a causative factor.

The patient gave no history of rheumatic attacks and no evidence of focal infection in the teeth or tonsillar beds. This fact disposed satisfactorily of the possibility of rheumatic headache.

Examination of the stool showed that the lower bowel was infested with an unusual number of bacteria, both anaerobes and aerobes. All varieties of the colon bacilli were cultured from the stool in great abundance and showed a high toxigenic index. The patient gave a history of protracted irregular bowel elimination characterized by constipation alternating with diarrhea.

One by one, as a result of this diagnostic review, many causes of headache were dismissed. The principal possibility which remained to be considered was sick headache or migraine. This interpretation in conjunction with a large psychoneurotic element and myositic infiltration in the suboccipital region, was offered as the proper explanation of the patient's condition.

Sick headache, or migraine, is capable of producing the entire symptom complex from which the patient suffered. The periodicity and paroxysmal character of the attacks, the attendant nausea and vomiting, chill and sweat, the occasional obscurations of vision prior to the attack, the actual hemianopsia, double vision, hemi-anesthesia, hemiparesis and ptosis of the upper eyelid, constitute definite components of the migrainous attack. They need not all occur at the same time. Some part of this complex may appear as an equivalent of the paroxysmal headache, and the attack itself may vary from time to time in its intensity and duration.

The change in emotional stability as well as the marked alterations in personality were consequent upon pronounced psycho-neurotic elements. These elements had their genesis in the strenuous life of the patient, combined with his growing neglect of proper hygienic regulations and an increasing degree of vitiation of his metabolism. The more or less constant dull occipital headache and pain in his neck were accounted for by myositic infiltrations in his suboccipital region.

The correctness of this diagnosis was confirmed by the result of treatment. The patient was withdrawn from active business for several months. His responsibilities were shifted and lessened. He was permitted to live a free, out-of-door life, with proper periods of rest and relaxation. Proper diet was prescribed and effective elimination was encouraged. For several months he was treated by deep massage in the upper cervical and suboccipital regions and was given daily exercise of an interesting and pleasurable nature. The exercise prescribed was golf. It should be noted, however, that even this form of recreation is to be prescribed with certain careful injunctions for the spirit of American enterprise and competition has done not a little to deprive the ancient and honorable game of some of its beneficent relaxation. Eventually the patient was able to resume his occupation and remained free from his troublesome headache so long as he kept himself in good condition.

In the course of narrating this clinical history, many possible causes of headache have been brought to light. Each of them is quite different from the others in its genesis and causative factors. It is for this reason that attempts have been made to classify headaches. They have been variously grouped according to their kind and cause. There may be certain useful implications in such classification, but they are largely of academic interest. Our immediate requirements in taking care of sick people demand an intensely practical grouping which, above everything else, indicates the kind of treatment best suited to each individual case. The diagnostic method already outlined supplies exactly this sort of practical grouping. It is effectively individual and therapeutically direct. It makes clear what should or may be done for our patient. It produces no static classification but, by classing each patient, at once points to the treatment needed. Only in the most complex and obscure cases does it leave any reason for doubt. This method makes it possible to identify brain tumor headache, not as a conventional picture for the textbook, but as an actual condition in the patient's experience. It discloses the sequence of development in such a headache with all of its attendant circumstances. It requires the indispensable aids of neurological, eye and X-ray examinations. The tests in which the patient proves negative are only slightly less important than those which are positive.

THE VARIETIES OF HEADACHE

(1) Not infrequently the headache due to other causes is treated as that resulting from brain tumor. In a large proportion of cases such misinterpretation may be avoided by the proper method of differentiation. Concerning the treatment of brain tumor headache, surgery holds the answer. If possible, the tumor or the pressure caused by it must be removed. In inoperable cases the headache is often relieved by the intravenous administration of hypertonic dextrose solutions in doses of 200 c.c. of a 25 per cent solution daily. This treatment is useful to lessen

the suffering in cases of brain congestion, swelling or edema due to any cause.

(2) Brain abscess headache may be similarly recognized. Its treatment is likewise surgical.

(3) Brain syphilis headache is especially important. It has often lasted for a long time without proper identification, but is seldom missed when the practical method of classification is applied. Its nocturnal occurrence is always a matter of suspicion, though it is not uniformly conclusive. The treatment of this headache embraces the administration of all approved antiluetic measures. The intraspinal route of treatment, once so strongly urged, is now largely abandoned. On the other hand, the use of potassium iodide in frequent doses is too often neglected.

(4) Brain inflammation headache, due to the various forms of encephalitis and meningitis, should as a rule offer little difficulty if the proper method of approach is employed. The headache of encephalitis may be treated by repeated lumbar puncture, intravenous dextrose solutions and, if need be, the judicious use of anodynes and narcotics. Meningitis headache may require similar means, but the epidemic variety is best treated by the antimeni-gococcic serum intraspinaly administered.

(5) Arteriosclerotic and hypertension headache may be identified by the evidence of structural and tension changes in the cardiovascular system. The diagnosis is supported by the absence of signs indicating other varieties. It is best treated by hygienic and dietary regulations. The medication usually employed is potassium iodide.

(6) Sinus headache is identified both by the positive and negative tests which it yields to the diagnostic method. In the vast majority of cases the identification is made by the direct examination of the local condition. In certain instances it is wise to go further especially in view of various intracranial complications which may confuse the diagnosis. The usual sinus headache is treated locally and surgically.

(7) Vacuum headache, recognized by pain over the eye and into the orbit, is identified by examination of the sinuses and the presence of Ewing's sign, tenderness of the inner, upper angle of the orbit. Its usual treatment is the application of astringents and local measures.

(8) Lower half headache of Sluder is identified by pain about the eye, upper jaw and teeth, extending into the temple, with earache and pain in the mastoid. It often extends into the occiput, neck, shoulder, hand, forearm and fingers. It is sometimes accompanied by sneezing and photophobia. Its accepted treatment is the direct application of cocaine to the sphenopalatine (Meckel's) ganglion.

(9) Toxic headache, due to alcohol, lead, tobacco, ether, carbon monoxide or hydrogen sulphate, is identified by the history of the case or by the detection of the toxic substance in one or more of the body fluids. The treatment of this form of headache depends on proper elimination.

(10) Anemic headache is recognized by examination of the blood. The treatment is that of the anemic condition.

(11) Renal headache is identified by examination of the blood and urine and by tests for renal efficiency. Measures of relief are those employed in the management of acute and chronic nephritis.

(12) Eye-strain headache is distinguished by the presence of refractive and other ocular errors in the absence of other signs. It is treated by proper ocular correction.

(13) Myositic headache is easily recognized by the more or less continuous, dull, aching pain in the back of the head and neck which is increased as a result of fatigue or strain. The presence of nodules in the scalp and neck muscles confirms the diagnosis. It may complicate the course of many different types of headache. It is best treated by continuous deep massage in the region affected.

(14) Digestive headache occasioned by constipation, hunger, hyperacidity and jaundice, is treated by the correction of these conditions.

(15) Nervous headache is extremely prevalent. Its diagnosis depends upon the elimination of all other causative factors and the establishment of an activating influence in the personality makeup, home conditions, marital relations and financial responsibilities sufficient to excite those anxieties, fears and inadequacies which are the foundation of the psychoneuroses. This is not merely a form of headache *sui generis*. It complicates to some degree, at least, nearly all other forms of headache as well as many other varieties of sickness in which the patient's anxiety continues to grow in proportion to the length of his illness. It is a most important and much neglected aspect in the treatment of headache as it is in the treatment of many other disorders.

(16) Sick headache or migraine is recognized by its periodicity, by its paroxysmal severity, and by its freedom from signs of disease in the intervals between the headaches. A distinctly familial type of this disease is recognized. It runs through the history of many families. It is common in squalid and unhygienic surroundings, but is equally well known in circumstances of comfort and luxury. It most often affects those who for any reason are forced to lead a sedentary life, and is much less frequent in those who pursue an active, energetic, out-of-door life and who in consequence of such pursuits develop a rugged constitution and personality. Its treatment may be divided into that of the paroxysmal attack and that of the interval between attacks.

Many remedies have enjoyed distinction and are still extensively used in the treatment of sick headache. At the beginning of the attack when the patient first feels chilly or experiences the familiar visual obscuration, a good dose of brandy or a cup of hot coffee will often avert the more serious developments of a paroxysm. Nitroglycerin 1/100 with erythrol tretronitrite 1 grain, taken at this time often proves effective. In my own experience nothing has given more satisfactory results than oxyquinoline in the form of Faivre cachets, 5 grains each, repeated in half an hour

if relief is not obtained. Aspirin in combination with pyramidon in some cases proves effective. The combination satisfactory for one patient may not serve for another, so that in this respect each patient must be individualized. When the headache is well established, $2\frac{1}{2}$ grains each of antipyrin and acetanilid, with $\frac{1}{2}$ grain codein, may be used every half-hour for three doses. The dangers of prolonged use of the coal-tar products should be emphasized to the patient and uppermost in the mind of the physician. The protracted use of these drugs produces such damage to the blood that the patient in seeking relief from these remedies creates a condition even more serious than the one he hopes to relieve. Morphine and like narcotics should be used only as a last resort and with full appreciation of the danger in thus treating a symptom of recognized periodicity and recurrence. Most recently, gynergen, the tartrate of ergotamine, which is a specific alkaloid of ergot, has been recommended either alone or in combination with bellafoline, both to prevent the acute paroxysm and to relieve it when developed. This drug may be administered in tablet form, from 1 to 4 tablets daily given one at a time at the outset and during the paroxysm, or it may be given by hypodermic administration, $\frac{1}{2}$ c.c. and repeated in the course of three to four hours if necessary. It is recommended because migraine headache is considered a sympathetic crisis. Two milligrams by mouth should arrest a migraine already started; 2 mg., also by mouth, daily, in habitual sufferers from sick headache may be doubled on the approach of the headache. Its use should be limited to those cases showing signs of increased sympathetic tone.

The treatment of the interval between paroxysms is of even greater importance. The most important single remedial agency is out-of-door life and exercise taken in the form most congenial to the individual. The physician should not, as is the usual practice, deliver his hygienic directions as casual instructions. Every detail of the treatment should be carefully set down in writing so that there may be no misunderstanding of its meaning. It

should include instructions for diet, the period and duration of rest, of relaxation, or recreation, of exercise and all special means of treatment to be employed. Water treatments are too greatly neglected. Most of these patients are greatly benefited in the first part of their treatment by the use of the Nauheim bath given two or three times a week. Should this water treatment prove too relaxing, the Aix or Vichy bath may give beneficial results especially in those who are greatly debilitated, under weight or muscularly flabby. Later, as the patient's resistance increases, a cabinet bath, followed by the Scotch pressure douche, will prove a stimulating tonic and reconstructive. A tonic tub bath should be advised every morning upon arising. Effective and regular elimination must be insisted upon and where necessary the proper mineral or vegetable laxatives employed to this end. Dietary fads must be avoided, but the digestive objections of each individual patient must be met and a diet provided with sufficient roughage to stimulate peristalsis. In some cases it will be necessary to resort to multiple enemata and other means of colonic irrigation. The entire success of the treatment will depend upon the efficiency of the methods employed to restore a defective and incapacitating metabolism to something approaching the normal. For this purpose a systematic follow-up system and a careful review of the patient's adherence to directions must be insisted upon.

All of these instructions concerning migraine Liveing set forth more than a half century ago in his remarkable book on this subject. He recognized many causes contributing to this kind of sick headache and expressed the belief that none was more potent than the nervous wear and tear in all walks of life.

The anxieties and strainings provoked by the struggle to reach what may allure but seldom satisfy us bear down heavily on our vital resistance until the machine is severely overtaxed. The hazards and burdens which Liveing saw in his time, he might see multiplied and compounded could he look upon our great cities of to-day.

Many causes which shorten life, lessen efficiency or foster disease arise from the congestion, haste and striving of modern living, especially in our great overcrowded communities. The parasitic advantages of such existence, appear to be more desirable than better health or fuller contentment. More intelligent living may in time prevent or weed out numerous ills which we are now compelled to bear. That time seems still a long way off. Meanwhile, we shall need to employ and improve such palliative equipment as we possess to combat the afflictions of body and mind.

THE CARDIAC NEUROSES *

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It is indeed a pleasure to participate in this symposium on "functional and nervous problems in medicine and surgery."

The practitioner of medicine who has experienced the changes in the methods of investigating medical problems in the past thirty years, if he compares the point of view of cardiology of the first with the last year, will be astonished. A new language has been evolved, a true vernacular. Since the war, psychology has come in for a rejuvenation, too, and as you know, have heard, and will hear, there is a completely new point of view founded upon experimental investigation.

I. CARDIAC NEUROSES

To begin the attack upon this problem of cardiac neuroses it seemed useful to review the subject matter contained under the same or similar headings presented by some medical authors of the past; for it seemed that such a study might help to develop the thought as viewed by those authors at earlier periods. The opinions as expressed in those ageing books can be accepted probably as the mature thought of the period, though it is true usually that the opinion expressed in printed books is about ten years old. Or stated in another way, the opinion of the text book is so mature and so widely accepted before the author will assume the responsibility of expressing it in print that ten years has elapsed since the opinion was first expressed.

From this survey of the changing point of view of medical thought it was hoped that it might be possible to express in a brief form a working definition of what to-day might be considered the essentials for a diagnosis of a cardiac neurosis.

* Delivered October 14, 1929.

Of many authors whose remarks might be quoted, there is one most interesting observation well worth the time to read and made nearly a century ago by Dr. John Calthrop Williams in 1836 in London.

"Allowing, however, that diseases of the heart have increased of late years, we have a clear and important explanation of the fact.

"With the advance of civilization, the physical and moral system of man becomes more sensitive, and then the passions necessarily acquire a greater influence over the animal organization; the more, also, the passions are curbed, after being once strongly excited and exercised, the more baneful is their influence on the nervous system, until they are completely subdued.

"When we reflect, therefore, on the powerful influence that mental emotions exercise over the action of the heart; on the changes affected, in this respect, by anger, hatred, and revenge—by love, joy, or sorrow—by avarice and ambition; when we credit our former assertion, that functional derangement will terminate in organic disease, and that this functional derangement is daily and hourly produced by the activity of these feelings; then we are bound to believe, that disorders of the circulation and the heart have increased of late years, and will still increase in proportion as the nervous system is affected by the more frequent and ardent operation of the passions. . . ."

Thus evidently he recognized the effect of emotions and this before psycho-analysis became Freudian and popular.

In 1892, Sir William Osler, in the text book "Principles and Practice of Medicine" in the second division of the section, Diseases of the Heart, places as number 5 Neuroses of the Heart and includes in that chapter Palpitation, Arrhythmia, Rapid Heart (tachycardia), Slow Heart (bradycardia, for which he coined the term "brachycardia"), and last "Angina Pectoris."

The paragraph on Arrhythmia contained seven items:

1. Paradoxical pulse
2. Intermittence of the pulse
3. Alternate pulse
4. Bigeminal and trigeminal pulse
5. Delirium cordis
6. Foetal heart rhythm
7. Gallop rhythm

To-day these are considered, with one exception, as concomitant of serious myocardial disease.

In 1895 Osler added to the section a differential between "true angina pectoris" and "pseudo-angina pectoris."

The same arrangement was retained in subsequent editions until 1907 when the heading was changed from "neuroses" to "functional affections of the heart" and Heart-block (Stokes Adams' Disease) was added. Angina pectoris had been removed from the group and was described in a separate division under "Diseases of the Heart."

In 1916 the same headings were retained and "fibrillation" was added and the term "neuroses" was omitted from the index.

It is interesting to note that "delirium cordis" and "fibrillation" are retained as separate rhythms. The electrocardiogram of the conditions had not yet become sufficiently known to be used for analysis in the text book.

In later editions of this text book, the whole division on functional affections has been moved into the first position and subdivided into

I. Symptomatic disorders

1. Heart consciousness
2. Cardiac pain
3. Effort syndrome
4. Cardiac asthenia in children
5. Palpitation

II. Mechanical disorders of the heart beat

A. Disturbances of rate

1. Tachycardia
2. Bradycardia

B. Disturbances of rhythm

1. Sinus arrhythmia
2. Extra systoles (premature contractions)
3. Simple paroxysmal tachycardia
4. Auricular flutter
5. Auricular fibrillation
6. Heart block
7. Alternation of the heart

Returning to 1898, Francis Delafield, in his lectures on medicine under the heading "The neuroses of the heart" describes "the irregular heart" and "angina pectoris." Of the irregular heart he said: "A large class of cases of disturbance of the action of the heart without structural disease, for which we have no good name, and which we cannot as yet subdivide in a satisfactory manner."

He then writes—"The heart's action may be too rapid, or irregular, or intermittent, or exaggerated, or too slow. These changes in the heart's action either occur in paroxysms, or continue for long periods; they occur after exciting causes, or continue when no cause can be discovered." Further on he says: "The physical signs are the change in the action of the heart and sometimes a murmur at the second left space, or at the apex." And again—"But it may be difficult to distinguish this condition from exophthalmic goitre, chronic myocarditis, diseases of the coronary artery, the fatty heart, or stenosis of one of the valves without a murmur."

As causes he names "tobacco, tea, coffee, anaemia, epidemic influenza and hysteria."

Tea, coffee, tobacco, anaemia and epidemic influenza may act as direct poisons to damage the muscle or bring it to a "critical" state by conditioning the muscle reaction through degenerative changes. If these agents are the etiological factors it is more correct to consider the result of their action as toxæmia rather than a neurosis.

Concerning angina pectoris Delafield states that it is "time to recognize the fact that there is no such disease but that attacks of pain of greater or less severity constitute one of the symptoms of a variety of cardiac affections."

About 1902 Strumpel under the general title "Diseases of the circulatory system," makes the first division "Diseases of the heart" and places in the fourth subdivision four topics, as follows: Cardiac neuroses, Angina pectoris, Nervous palpitation, Tachycardia.

Angina pectoris he calls steno-cardia, from the Greek meaning of "narrow" and expresses the opinion that it is not an independent disease or "pure neurosis." He credits Nothnagel with the description of the "vaso-motor form of angina pectoris" because of the associated vascular contraction in the extremities, as indicated by pallor, cyanosis and paraesthesia.

He defines nervous palpitation as "the subjective perception of the movements of the heart." Tachycardia he considers a "peculiar and quite rare form of neurosis," but does not analyse it.

In 1911 the topic, "Diseases of the circulatory organs" was changed from Number I to Number III of the subdivisions and instead of four there are six headings:

1. Purely psychogenetic heart disturbances.
2. Nervous heart disturbances from endogenous toxic influences.
3. Nervous heart disturbances due to exogenous toxic influence.
4. The nervous attacks of patients with heart disease.
5. Nervous palpitation.
6. Paroxysmal tachycardia.

The "purely psychogenetic" disturbances he considers result from "primary groundless fear of any origin whatever."

The endogenous influences mentioned are caused by the thyroid and other endocrinous glands as well as the distention of the colon.

Tobacco and alcohol are named as the exogenous toxic influences.

The nervous attacks of patients with heart disease he subdivides into five (a) attacks of simple weakness, (b) attacks of steno-cardia, (c) attacks of fright and anxiety on going to sleep, (d) attacks of humid asthma or edema of the lungs, (e) attacks of tachycardia. Numbers 5 and 6 remain the same as his previous 3 and 4, respectively.

Two years later, in 1913, no change was made, but in 1926, "Bradycardia" was added as a seventh subgroup.

The group of symptoms described in the fourth heading are associated with myocardial failure and degeneration but in the light of our present knowledge they can not be considered as neuroses.

The "tachycardias" were not analysed or described in detail even in the edition of 1926 as they might have been in view of the knowledge of those mechanisms as elucidated by the electrocardiograph.

Under date of 1910 Sir Clifford Allbutt writes in the System of Allbutt and Rolleston, under the "Functional disorders of the heart," that: "In health the disturbances are rhythmic, harmonious, controlled; in functional diseases they are arrhythmic, uncontrolled:—the going system halts or staggers, but not beyond recovery;" and he proceeds with the inquiry: "Is there a man so stoutly knit, whose inhibitory nerves are so powerful and alert, that in passion or 'twixt doubtful fear and feeble hope' he has never felt his heart climb into his throat? Thus functional diseases of the heart are familiar to all."

In a recent text book of medicine there is a group of "symptomatic disorders of the heart," which are defined as "not associated with any demonstrable cardiac disease. The most important of these are palpitation and cardiac pain, both of which are very common, and are referable to a number of causes, such as disorders of the nervous system, infections and various forms of toxæmia. These symptoms may also be manifestations of organic heart disease, and differentiation between the functional and organic conditions is not always easy."

After describing palpitation as "an irregularity usually due to premature contractions," mention is made of "heart pain" and the "irritable heart."

Some authors employ the term "effort syndrome" as an associated or complicating diagnosis with structural pathology, and as a separate diagnosis also use "irritable heart," but most authors, however, use the terms effort syndrome, irritable heart and neuro-circulatory asthenia

as synonymous. Also "functional systolic murmurs" is used as a diagnosis. In these ways the conception of neurosis is avoided.

The long lists of conditions quoted from text books and authors have quite properly dwindled by the elisions resulting from advancing knowledge. The absence of discoverable structural changes seems to have been the only guiding principle. It is indeed timely that the contacts of both psychology and cardiology should be discussed more frequently and in greater detail, for as the autocrat says in "The Deacon's Masterpiece":

"Little of all we value here
Wakes on the morn of its hundredth year
Without both feeling and looking queer."

The emotional state of the nervous system and its relation to the pathologic physiology of the heart has been completely ignored. The lists of terms describing rates and rhythms, so-called functional, symptomatic and mechanical disorders still omit to ascribe a name to or define that group of rather frequent disorders of the heart action, in the pathogenesis of which the intensive action of the psychic part of the nervous system predominates.

"In view of the demonstrated reactions of the mind to conditions of environment, used in its broadest sense, it appears justified to connect them with the heart disorders which occur so frequently with the emotions as the etiological factor. From work done by psychologists and psychiatrists it seems justified to point out that it is an unhappy status of mind due to unfulfilled desires and conflicts that sets the stage, or conditions the onset of a cardiac disturbance, as one way of escape from unhappy situations or as an offensive in the accomplishment of a much desired objective."

Since then the emotional disturbance acts through the physiological mechanism of the sympathetic system and the structure of the heart is not damaged, if it is to be considered as a biological reaction, a working formula might be phrased as follows:

synonyms of a condition in which the probably hereditary circulatory deficiency is only part of a general, multiple, systemic instability—or pathologic constitutional entity (Warthin).

ETIOLOGY

To discover the pathogenesis or causal conditions will require the tactful, patient, skillful detailed inquiry as to the physical and social conditions at the time of the onset: the understanding of the emotional history of the family and individual; of the social and financial status before and anticipated; of the marital and sex-conditions as they are and have been, and of the possible defensive or offensive needs of the situation from the point of view of the patient. Prolonged illness or sudden injury may be the precipitating cause. Ignorance of what constitutes disease of the heart and fear of the unknown may cause profound disturbance and depression. Prolonged intimate daily contact with those suffering from terminal failure of the heart may set the conditions. Parental or professional suggestion of a diseased heart may be effective in producing conditions of fear and abnormal cardiac reactions.

Toxic substances of tea, coffee, tobacco and alcohol in regular or irregular doses may act to render the heart more sensitive to the emotional struggle. Mechanical conditions such as distending stomach, or colon, and the accidental escape of air or gas into the abdominal cavity through the uterine tube during a test for patency may precipitate an unusual mechanism. It may not be easy to recognize the emotional factor in these mechanical discomforts but ignorance, surprise and fear may be the correlated emotional stimuli of the sympathetic system.

V. SYMPTOMS

The nerve supply of the heart consists of two sets: first, the vagus which slows or stops the heart beat and second, the sympathetic or accelerator which increases the rate and augments the action. These two systems when acting

on a viscus are antagonistic—one or the other controls. The so-called depressor nerve may be some afferent fibers in the vagus which, under pathological conditions, may convey painful sensations. As yet there is only the suggestion from experiment that the conditioned reflexes explain why premature contractions or tachycardia, result from emotional states.

With vagal and sympathetic disturbances there may be altered rates, rhythms and sensations, whether arising from digestive tract or circulatory system disorders. The mere inflation of the abdomen may cause tachycardia. The same type of changes may occur with endocrine disorders—thyroid, gonad or adrenal.

Symptoms are the result of modification of structure, size, shape or position, or of function together with the reaction of the protective mechanism of the individual which may be disagreeable subjective sensations.

Hans Dreisch has shown the well known relation between certain conscious phenomena and the vital processes. Pawlow has shown that hunger and the smell of food may have a sequence in the secretion of saliva and he has demonstrated that the tone of a bell may cause the flow of gastric juice and other conditioned reactions. It is common knowledge that emotions and suggestion, or auto-suggestion, can and do accelerate the heart rate, which is assumed to be a result of stimulation of the sympathetic system.

The subjective sensations are described by the patient in terms of the individual intelligence and culture—a knowledge of these feelings is essential to the physician for a due appreciation of their place and importance in the clinical syndrome and the inquirer should phrase the questions so thoughtfully and in such simple language as not to suggest the character of the answer. Beware of the question with an entangling implication.

The patient may complain of one or several symptoms—simple consciousness of the heart action, or a full, burst-

ing or constricting sensation with or without acceleration of the heart rate. Dizziness, giddiness, faintness, choking or gripping sensation of the throat, often swallowing and belching air may be described. Occasionally breathlessness on slight exertion, very rarely dyspnoea. Sweating may be profuse and disagreeable tremor may be unnoticed. Rather slight exertion may produce the sensation of fatigue sometimes quite profound. Occasionally pain is complained of as located in the precordium and only careful repeated observation and interrogation will differentiate it from the pain of coronary disease. Even the blood pressure may be unstable, too high or too low. Such symptoms may suggest also disease of the nervous or endocrine system, an anaemia, a myocardial degeneration, or the effect of a toxic agent.

VI. PHYSICAL EVIDENCE

Absence of the usual results and symptoms of structural damage or failing heart. Presence of one of the various types of arrhythmias, usually of paroxysmal onset. Often accompanied by a diffuse, vigorous action of the heart.

During the physical examinations it is important not to introduce new suspicions or suggestion of disease and at the same time to be so systematically thorough as to inspire confidence that all has been done that should be done. This will aid, too, in giving weight to the opinion expressed after completion of the examination.

VII. DIAGNOSIS

The student of medicine is subjected to the possibility of an inhibition as often as he is introduced to the consideration of diseases of the heart by observing hospital patients with advanced organic damage or patients in the late stages of cardiac failure. These patients often are readmitted once or twice and then come to necropsy. The gross or microscopic pathologic findings often impress the observer and suggest that structural changes are essential to even physiologic disturbances; that murmurs accom-

pany all heart disease and indicate the onset of congestive failure and a rapid course to the necropsy table. This early experience with terminal congestive failure often makes it extremely difficult later for the more experienced practicing physician to recognize the part the emotions play in cardiac physiology.

The post war advances in knowledge and popular interest in psychology have directed attention to the importance of psychic states in the life of the individual. Since the disorder is one of the regulatory mechanism the failure will be of this and not of the mechanical or structural system. If the disorder occurs after a structural damage there will be the combination of the two but in any event there will be an illogical or bizarre group of symptoms when compared with reactions incidental to the often seen failure of the myocardium.

In arriving at a diagnosis it is necessary, first—to analyze the separate symptoms, then make a physical examination to discover the structural state and finally make an experimental test of the individual functions to discover deviations from normal; second—it is necessary to synthesize the findings into a syndrome fitting the pathologic physiology and indicating the pathogenesis.

VIII. PROGNOSIS

In its broadest aspect, prognosis is the answer the patient desires and about which he questions himself and may not question the physician, for the questions are not always consciously or verbally expressed.

If suspected of having heart disease—Have I, or have I not “heart disease,” “angina pectoris,” “arteriosclerosis,” “hardening of the arteries?”

If he has some cardiac defect—Am I going to die, or am I going to get well or be “cured?” Shall I be ill a short or a long time? Shall I suffer pain or die suddenly? Shall I be permanently crippled? Will my earning capacity be

affected? Shall I change or lose my job? Must I assume financial debt? Can I afford to be ill?

The replies to the patient should state the facts in such a way as to answer these questions and at the same time inspire courage, hope and assurance that all will be well.

IX. TREATMENT

Exclude tea, coffee, tobacco, alcohol, sexual excitement. Rest, regular hours, ten hours in bed. Regular meals. Hydrotherapy—bath, tepid, vigorous coarse towel. Prescribe exercise—diverting, graduated and increasing amount, especially for those with acceleration, palpitation, premature contractions—a safe and sure way of inspiring confidence in the patient's self. Drugs for brief period only such as mild hypnotics, the bromides, or phenobarbital. Exclude opium and digitalis. They should not be administered, except as needed to alter or control the cardiac mechanism.

As to surgery—Gordon has stated concisely: "No removal of tissue or organs, no artificial correction of disturbances, however accurately or skillfully they may be done, will succeed in making a psycho-neurotic discard his fixed ideas, his hypochondriasis, his abulias, his fears or his obsessions." But skillful, technical analysis may indicate the rational therapy which will assist effective illumination to do its work.

Be sympathetic in manner of approach and relations.

It is most important how a thing is said rather than what is said and how a thing is done rather than what is done.

Gain intelligent coöperation through frankness, understanding and confidence.

Give assurance of no danger.

Do not vacillate.

Foster favorable emotions and

Avoid unfavorable emotional reactions.

Make favorable suggestions and

Avoid adverse suggestions.

Build up a favorable sentiment, courage, hope.

A few cases are cited to illustrate some of the types:

X. CASES

1. Woman, age 45, single—difficult home conditions—brother with advanced arteriosclerosis and intermittent claudication. Attacks of vigorous palpitation and irregularity due to auricular extra systoles. Worse if lying down—relieved by regular recreational exercise in open air away from home.

2. Man, age 40—hard working, long hours of application, financially and socially ambitious—very unhappy in marital relations. Each morning 11 A. M. skipping of heart beat and conscious of pause following premature ventricular contractions. Time of day associated with period of gastric hyperacidity. Coffee and tobacco increased attacks. Legal separation and divorce and subsequent marriage to wealthy woman relieved the neurosis.

3. Young woman, age 20, given to extravagant uses of coffee, cigarettes and liquor—during violent emotional controversy with her mother in presence of a lover sudden onset of paroxysmal auricular tachycardia—relieved by pressure on cervical vagi.

4. Mother, at age 55, chronically enlarged tonsils and gallbladder, emotional and profoundly religious and stubbornly bigoted—in altercation with son as to his manner of life—sudden onset of paroxysmal fibrillation relieved by rest and digitalis and living apart from son. A second attack precipitated by disagreement with daughter-in-law, wife of second son.

5. Man, age 35, hard physical labor—deeply interested in a new thought religion—under emotional state brings on paroxysmal ventricular tachycardia. Seen in four different attacks all precipitated by emotion conditions. All relieved by rest and digitalis.

6. Man, age 35, wife chronic invalid, found companionship in wife of another man who was helpless invalid. Had attacks of vertigo on street. Excuse for companionship. Later breast pain on beginning to walk but, as one method of meeting his mistress was walking, pain always left if he continued to walk. Removal of all intervening difficulties and later accomplishment of desires attended by complete relief.

In this short description I have presented some of the salient features of pictures met in everyday practice with cardiac patients, which deserve serious consideration by the psychologist and sociologist, as well as by the internist.

MEDICINE IN INDIA*

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I appreciate the honor conferred upon me as expressed in the invitation of your secretary to address this section of the Academy on the subject of Medicine in India.

I value the privilege accorded in-as-much as it evinces a sympathetic interest on your part in the Medical Service of a nation that amid political upheaval and communal conflict is striving to keep pace with professional progress of the West where less distracting conditions prevail.

The limitations of this paper will not permit a scientific discussion of diseases peculiar to India, other than the mention of some of the conditions which underlie the prevalence of disease, having unusually high incidence and devastating mortality.

As a prelude to the general subject of medicine in India, it may not be out of place if I present a summary of the medical forces at present operating in that vast and populous country. First of all then as to *Organized Medical Relief* among India's 320 millions of the civil population (to be concise 318,942,480 according to the last (1921) census), the following medical services obtain in India.

THE INDIAN MEDICAL SERVICE.

This constitutes the principal government department of medical relief and public health. The I. M. S. is made up of commissioned British medical officers appointed through the India Office in London. The service is supplemented by a large corps of subordinate medical officers recruited and appointed in India, who are graduates of the Indian medical colleges and medical schools. This entire

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service is eligible for military duty in time of war. The total number employed in this service by the Government is 302.

The officers of the India Medical Service direct the medical administration of the Provinces, provide teachers for the medical colleges and serve as civil surgeons in charge of the more important districts in each Province. The service has produced a number of devoted and brilliant investigators of international reputation. In the research department a staff of seventeen British workers is maintained with an ample corps of associated assistants engaged in research work. During 1927-28 some sixty-six important investigations were carried out; and the Government appropriated \$240,000 for the purposes of this department. British medical officers are gradually being supplanted by Indians in anticipation of prospective self-government.

THE ROYAL ARMY MEDICAL CORPS, R. A. M. C.

This service is concerned only with the British Army, foreign and native, numbering 55,000 British and 133,000 Indian soldiers.

WOMEN'S MEDICAL SERVICE

This service is for women in India, is of recent origin and is conducted under the National Association for supplying medical aid by women to the women of India (formerly the Countess of Dufferin Fund). This organization, controlled by the government, numbers 22 British trained female medical officers, 22 Indians or Anglo-Indians, trained, for the most part, in India. There is a very large percentage of the women of India that can be cared for in sickness only by women doctors particularly in the central, northern and eastern provinces, where the purdah system is relatively most rigid and mortality statistics are highest among women for the same reason. Infant mortality is appalling and maternal mortality higher than in

most other countries especially in the great cities. According to health report for 1924 of the Public Health Commissioner with the Government of India, the maternal death rates in confinement cases varied from 1.0 per 1000 in Rangoon, Burmah, to 48 per 1000 in Parorrn. In the Calcutta Health Officer's report the rate given was 18.0 per 1000. In Bengal from 1919 to 1925 the rate given was 12.2 and in Bombay for 1924 it was 16.7 per 1000.

These figures for reasons given elsewhere are not very reliable.

MEDICAL MISSIONS

In Medical Mission Service there are 270 foreign and 212 qualified Indian physicians on the combined staff of mission hospitals throughout India. To these might be added a total nursing force of 369 foreign nurses and 516 trained Indian nurses. Medical Missions are conducted under the auspices of the various evangelical churches carrying on Mission work in India. This service is supported by the contributions of foreign church organizations, by the local gifts on the field and by government grants-in-aid. The foreign workers' salaries are contributed by home boards or missionary societies having missions in India.

To the foregoing organized Medical Service should be added the private practitioners, national and foreign, residing mainly in the large cities and towns, and an indefinite number of qualified and unregistered practitioners. There are registration laws, enacted in 1912, but in-as-much as there is no law in India *compelling* the registration of physicians in order to practice, the precise number of qualified practitioners is not ascertainable, since many practicing physicians do not register.

Mention might be made also of a considerable number of private practitioners of the Unani and Ayur vedic systems with a few recognized schools in Bombay, Calcutta, Madras, and in some of the other large cities.

There is an innumerable company of the Hakims and Vaidis whose training is mainly a matter of heredity. These men possess no knowledge of the foundation sciences of medical practice, i. e., chemistry, physiology, anatomy, etc. Their knowledge consists of an acquaintance with the therapeutic action of some of the indigenous remedies, fruits, herbs, leaves, roots, and on occasion, common English medicines such as soda bicarbonate, potassium iodide, belladonna, cannabis indica, mercury, arsenic, nux vomica, opium, which are available on purchase in the bazaars of the cities and towns over the country.

MEDICAL INSTITUTIONS

The hospitals, dispensaries, and medical schools—these are enumerated (census 1921) according to (a) those in *British India*, containing (1) those in the nine Governor's Provinces or Presidencies and three other outlying Provinces; (2) the *Indian States* under Indian rulers. The former contains an area of 1,094,300 square miles, 61 per cent of the whole area and have a population of 247,942,293, or 77 per cent of the whole. The Indian States represent an area of 711,032 square miles or 39 per cent of the whole, and a population of 71,939,187 or 23 per cent of the whole population of India. To provide for this great mass of humanity the qualified doctors are distributed as follows:

DOCTORS

For each 100,000 persons in British India the distribution of doctors varies according to the location and accessibility of the province. In the Governor's Provinces or Presidencies the ratio varies from one doctor to 4761 as in the Bombay Presidency, to one in 35,714 in the Central Provinces where the square mile area to the population is greater.

MEDICAL INSTITUTIONS AND HOSPITAL BEDS

For each 100,000 of the population in the nine Governor's Provinces there are 2.6 institutions as a maximum,

in Bombay Presidency, to .5 institutions for every 100,000 in Assam. The Punjab has one medical institution to every 100,000 of the population. The three outlying Provinces, owing to their larger area and comparatively sparse population, have a maximum of 11.25 medical institutions to each 100,000 of the population.

NATIVE STATES

In the Indian States statistics are less completely kept than in British territory. Of medical institutions in these states there is a total of 736 hospitals and dispensaries, or 2.29 medical institutions to each 100,000 of the population in the seven principal Indian states for which statistics are available and representing 32,079,919 or about 30 per cent of the total native state population in these states. For the same institutions on a basis of fifty beds to each institutions there could be 11.4 beds to every 100,000 of the population.

Throughout the whole Indian Empire there is approximately one qualified doctor to 25,000. In the large cities the proportion is very much higher. For example, in 1927 in the city of Madras with a population of 526,000 there were 629 doctors practicing, or one to every 840 persons; at the same time in the Madras Presidency with a population of 42 millions there were 2389 qualified doctors or one doctor to 17,580 persons. This is probably a fair average for other Presidency cities.

REASONS FOR OVERCROWDING OF PHYSICIANS IN THE CITIES AS COMPARED WITH THE PAUCITY OF DOCTORS IN THE RURAL AREAS.

In a word, it is poverty and consequent low order of social life, in the village areas. The educated doctor without an altruistic purpose finds life in an outlying village a boredom, for the reason that economically and socially, life there has very little attraction for such as he; and this in spite of forty thousand miles of railway and the rapidly

increasing rural motor services connecting villages and cities.

India is largely an agricultural country; 90 per cent or 286 millions of the population in British India are agriculturists living in 700,000 villages; the average village containing 375 persons. And herein lies one of India's greatest medical problems. Although disease is rampant in the cities and large towns they have abundant medical aid with doctors clammering for practice; while in rural India 75 per cent of the inhabitants have practically nothing; certainly nothing that can be called even remotely adequate medical aid.

To secure even the vital statistics in rural India is itself an enormous task; and at best the reports are unsatisfactory and unreliable, due to the fact that in these rural areas the vital statistics are based on statements of ignorant village officers whose information concerning disease prevalence and mortality is, in most instances, acquired from statements of the people themselves who make their own diagnoses. Patients suffering from febrile diseases such as pneumonia, relapsing fever, enteric, tuberculosis, septicemia, and other infections, and not infrequently plague, are reported as "simple fever." Similarly patients suffering from dysentery, enteric, cholera or Banti's disease may be reported as "diarrhea." According to the Director of Public Health in Bengal, 25 per cent of the deaths go unrecorded.

High mortality in the cities is a part of the medical problem that can be solved only by publicity, education and sanitary reforms.

As ruralism in India connotes paucity of medical relief on the one hand, so urbanism (if I may coin a convenient term) spells disease prevalence at the maximum. Bengal is the most highly congested province in India with 46 million inhabitants. Col. C. A. Bentley, Director of Public Health in Bengal, recently in a public address in Calcutta disclosed the following rather startling facts. "The

total annual mortality in Bengal from all causes is approximately 1,500,000 or over 31 per 1000 of population. Half this number, or 75,000 deaths, occur among children under fifteen years." According to Col. Bentley one-fourth of this mortality is due to preventable diseases. Cholera and malaria are responsible for 470,000 deaths annually. Enteric has a death rate of 50,000 to 100,000, varying in different years. The mortality from tuberculous is approximately 100,000 annually. Among the startling features of Col. Bentley's report is the fact that 55,000 newly born babies die annually of tetanus, the result mainly of ignorance, uncleanly habits and the unsanitary practice of the untrained dhias or native midwives.

According to the report of the Calcutta Health Officer, we find that for every boy between the ages of 15 to 20 years who dies of tuberculosis, there are six deaths from the same disease among the girls. This officer referring to this unnecessary mortality declares: "I am convinced that it is the retention of the Purdah system in the densely populated gullies of the congested cities that dooms so many young girls to early death from tuberculosis." (In the Purdah system the Zenana in order to secure absolute privacy is usually located in the center of the dwelling where the admission of light and adequate ventilation is a practical impossibility.)

For the city of Calcutta the City Health Officer's report deals almost exclusively with deaths. "Assuming there are four or five cases living for each death registered, there are probably about 10,000 living cases of tuberculosis at any given time in the city of Calcutta, or one in every 132 of the population."

I would say, from personal experience that Bombay should be placed in the same category with Calcutta.

OTHER MEDICAL INSTITUTIONS

In addition to the regular hospitals and dispensaries three classes of institutions exist. They are the Leper

Asylums, Tuberculosis Sanatoria and the Mental Hospitals. Of the Government Leper Asylums fifty are maintained by the British Government, and eight by Indian States. These institutions are under direct care of the Government Subordinate Medical Service. The Leper Mission, known as the Mission to the Lepers in India, and the East, is supplemented by a substantial branch organized in the U. S. A. and known as the American Mission to the Lepers. This combined organization maintains fifty-two Leper Asylums, thirty-seven of which are supported wholly and fifteen in part by the Leper Mission. In the Leper Mission institutions there are eight residential European doctors, and twenty-three Indian residential doctors; thirteen European doctors and fourteen Indian visiting doctors. The number of lepers reported as treated in the Leper Mission institutions in 1928 was 6986. In addition the Mission maintains thirty-nine homes for the untainted children of lepers, in which there are collectively 815 inmates. Most of these asylums are superintended by clerical missionaries, the professional service being carried out by subordinate Indian doctors.

The reports from the Indian state asylums and from some of the British Government institutions are very incomplete.

The census of 1921 gave the number of lepers in India as 102,513. This is probably below the actual number since many early cases are concealed or undiagnosed. Referring to the number of lepers in India Dr. S. E. Muir, special leprosy research worker in the School of Tropical Medicine in Calcutta says: "We think it would not be an over-estimate to put down the number of lepers in India as somewhere between a half and one million." In some districts, in which a census was made by the Leprosy Relief Association, the incidence of leprosy was four or five times that given in the government census of 1921.

The British Empire Leprosy Relief Association organized under the patronage of H. R. H. the Prince of Wales.

and the Viceroy of India, as chairman, has raised an endowment fund of £150,000, which is being used for the work of research, the training of special doctors and maintenance of institutions for the special treatment of leprosy. A vigorous campaign is in progress with the object of ultimately stamping out the disease.

The Indian Council of this organization in 1926 issued a "Memorandum on the methods of conducting the anti-leprosy campaign in India." This document sought to bring out the following main points, which according to the latest scientific researches should be the base upon which all efforts ultimately to eradicate leprosy must rest, namely:

(1) Pauper lepers form only a small fraction of the leper population, and the disease is common among all classes of the community.

(2) Segregation is *not* the most appropriate method of dealing with lepers for

(a) financially the segregation of all lepers would be impossible;

(b) any attempt to impose forcible segregation would drive patients, particularly those who are suffering with the first stages of the disease, to conceal their misfortune; and as has been the case where such means have been adopted, only the more advanced and obvious lepers would be segregated.

(3) The majority of the advanced cases are the most highly infectious and are less amenable to treatment, while the early stage cases in which the disease has made but little outward manifestation, can be controlled by treatment.

(4) The strongest hope of stamping out the disease lies in providing facilities for the treatment of early cases.

The India Council, therefore, while it did not desire to minimize the usefulness of homes and asylums for the care of lepers, strongly recommended that the efforts of the Pro-

vincial Committees should, for the present at least, be concentrated upon the establishment of dispensaries to serve the following objects:

(a) To induce patients to come forward at an early stage in the hope of recovery instead of hiding their malady till it becomes more advanced, more infectious and less remedicable; and so

(b) To shut off the sources of infection as the number of infectious cases will continually tend to diminish and the opportunities for infecting the next generation will become fewer.

The Provincial Committees have placed the training of special doctors for the proper diagnosis and treatment of the disease, in the forefront of their programmes.

A general appeal for funds was made on the formation of the Indian Council and closed in January, 1926. Realizations produced Rs 20,000,000 (\$700,000). This was invested and forms the capital of the Association. The latest report of the Indian Council shows that its work is vigorously being prosecuted, and shows that scientific research is continually illuminating the general problem and that the beginnings of genuine progress towards the eradication of leprosy in India are being made. One of the first particular tasks to which the Council has directed itself is the discovery of the extent of prevalence of the disease in India. The method of inquiry adopted is to establish a treatment centre in a leprosy district and to approach the census problems there through the offer of treatment. The survey was experimentally begun in Manbhum district of Bihar and Orissa, then in the Bankura district of Bengal and thereafter in three areas in the Sonthal Parganas in the same part of India and later still in the Chin Hills, in Burma.

"In the first three districts the incidence of leprosy was found to be between four or five times that given by the Government census figures, but it cannot be claimed that

even this survey has revealed the total incidence, as second visits to certain villages generally resulted in the discovery of even more cases. . . In one high school 11 cases of leprosy were found among 300 boys." The Council deduce that there are at least half a million people in India suffering from leprosy. It was discovered in one area of the Sonthal Parganas surveyed that: "Hiranpur has 1,197 lepers per 100,000 of population: out of 163 villages 106 were found affected with leprosy."

Recently special outdoor leper departments have been established in connection with existing dispensaries throughout the country. In these the newer treatment by the hypodermic method is in use with encouraging results. Results, however, are likely to be less satisfactory in outdoor dispensaries where exercise and dieting cannot be properly controlled. Segregation for the entire leper population would, on the other hand, be financially impossible at the present time.

TUBERCULOSIS SANATORIA

The Government maintains six sanatoria, three of them are located in Indian states with several more in contemplation. There are six sanatoria conducted under Mission auspices with others in anticipation. The largest and most comprehensive sanatorium in India is the Union Mission Sanatorium at Arogyavaram in the Madras presidency, which contains 180 beds. This institution is a model one and is conducted as a union organization in which fourteen different missions unite. Five other missions maintain sanatoria in different parts of the country. There are also a few private institutions. The total number is very inadequate judging from the waiting lists and applications for admission. Tuberculosis is rampant in many of the large cities, the result of poverty, overcrowding, the purdah system among females, and the unsanitary surroundings of the city homes. According to Sir Leonard Rogers there are, excluding malaria and tropical fevers, "more deaths from tuberculosis in Calcutta than from any

one of the so-called tropical diseases." The Health Officer in Calcutta estimates 10,000 tuberculosis patients in that city. The large cities have become clearing houses for tuberculosis from which the disease is spreading to the rural areas.

Village people accompanied by their families are attracted to the cities in search of employment in the cotton and jute mills or flee from their villages to the cities during outbreaks of plague and other epidemic diseases. In the cities they live in the already overcrowded chawls; later, on return to their villages, many of them are the victims of tuberculosis, who in turn infect other occupants of their homes. The disease is notably common and undoubtedly on the increase throughout India.

MENTAL HOSPITALS

The insane population of British India numbers 88,305 or 3 in every 10,000 of the population as compared with 40 insane persons to every 10,000 in Great Britain. There are 20 insane asylums in British India and Burmah. It would probably be true to say that there is but one mental hospital in all India that makes any pretense of keeping up-to-date as regards organization, staff and equipment. This is the mental hospital for Europeans located at Ranchi. There are six central mental hospitals for Indians under the care of a full time civil surgeon, who is usually an alienist. The remaining 13 are in charge of the district civil surgeons who have other duties engaging their attention.

In the Indian States, with the exception of Mysore, the insane are cared for in the common jails and all are overcrowded. In Bengal with 46 million people there is no mental hospital. Insane Indian patients from this Province are sent to the Mental Hospital for Indians in the adjoining province.

There is woeful indifference and apathy on the part of the Indian public towards psychiatry and cognate interests.

evidenced by the lack of any institution for the care of and treatment of the mentally defective, the feeble minded, and the epileptic population. The Indian year book for 1929 says: "There is still a lamentable failure everywhere to appreciate the intimate association of crime with mental disorder and the extreme paucity of medical men throughout the whole of India with any real knowledge of mental diseases leaves the decision of questions involving law terms and responsibility in crime in the hands of medical men who are in no sort of sense experts." In other words, the current ideas both as regards the theory and practice of dealing with insanity and crime in India can only be described as "archaic" according to this authority.

BIRTH AND DEATH RATES FOR 1926

In 1926 the birth rate in British India was 34.77 per mille and the death rate 26.76. In the same year the infantile death rate was 188 per mille, an increase of 15 over 1925. The comparable death rates for other countries in 1926 were: Canada 102, U. S. A. 73, England and Wales 70, Japan 166.

Of the total mortality in British India 24.6% occurred during the first year of life, the corresponding figure for England and Wales was 10.7%.

In 1925 India's birth rate was nearly twice that of England and Wales, 3 times that of New Zealand. The infant mortality was $2\frac{1}{2}$ times that of England and Wales, $4\frac{1}{2}$ times that of New Zealand.

Government statistics for rural areas are less reliable than those in the cities, for the reason that in the villages vital statistics are gathered by ignorant village officers or the police, persons who are often incapable of making accurate reports. Such statistics for rural areas must therefore be regarded as only fairly approximate, especially as regards epidemic disease.

In many of the large cities and towns the death rates

during the first year of life are not infrequently much higher than those given above, *i. e.*, in Poona for example, it is 590 per thousand, Cawnpore 495, Rangoon 342. While maternal deaths vary between 5.5 per mille in rural areas to 12 per mille in cities.

The following mortality record of prevalent diseases is taken from the government records for 1925:

Cholera	15,645 cases
Smallpox	85,886 "
Plague	117,717 "
Dysentery and Diarrhea	208,412 "
Respiratory diseases	326,557 "
Other diseases	147,337 "

It is estimated that during the 20 years following 1896 when plague first appeared in Bombay, twelve million people died of that disease.

During the influenza epidemic which appeared in India in 1918, continued through a part of 1919 and subsequently in endemic form until 1920, it has been estimated that four millions died of the disease. Some authorities placed the total mortality of the entire outbreak as high as seven millions.

This frightful death rate may be attributed to lack of resistance, the result of underfeeding and to overcrowding in the houses at night. The average home provides little or nothing in the way of ventilation. The mortality rate was higher than that of the plague at its worst, death in most instances being due to pneumonia or early heart failure.

The Director of Public Health in Bengal says (and the Public Health Commissioner of Bombay agrees with him): "The callous indifference and ignorance to the laws of hygiene and sanitation, the ingrained conservatism and woeful fatalism of the masses can only be removed by extensive propaganda." Said the India Commissioner of

MEDICINE IN INDIA

Public Health at the Far Eastern Congress on Tropical Diseases in 1927: "The information furnished for the great group of infectious diseases of world import, i.e., plague, cholera, smallpox, yellow fever, typhus, malaria and dysentery shows (says the Public Health Report already cited) that if we expect typhus and yellow fever, India is one of the world's reservoirs of infection for the others and the main reservoir of infection for plague and cholera." The significance of these facts must, adds the Commissioner, be obvious to all who think: "Briefly their implication is that India's house, from the public health point of view, is sadly out of order and that this disorder requires to be attended to. It is not for India to say that so far as she is concerned prevention is impossible. If we think of the effects of sunlight on tubercle ridden children, of the effect of feeding on rickets, cholera, dengue, ankylostomiasis and filariasis can be and have been overcome, we need have no fear in regard to India provided the necessary measures are put into operation." The basic enemies of all health activities are excessive poverty and gross ignorance.

CHOLERA REQUIRES SPECIAL MENTION

Lt. Col. L. C. Dunn, D.T.M., I.M.S., Director of Public Health of the United Provinces, in an address on the subject of "Cholera" at a recent meeting of the Christian Medical Association of India made the following observations:

"He considered that we were making much progress in the study of the disease, and that complete prevention of the disease would be realized shortly. He considered that the idea that cholera was an endemic disease was entirely wrong. The first cases of the disease in a district are *always* imported, and are not endemic. In 90 per cent of the villages in the U. P. the disease does not exist, therefore there is no real endemicity. If it were true that carriers could carry pathogenic organisms for 40 days, without showing any symptoms of the disease, then the problems were desperate, but the results of very careful inquiry show that persons apparently quit ^{the} _{the} who are carriers

will never infect anyone else. Thousands of examinations show this to be true. The vibrio may be there, but its pathogenicity is nil. It may be an attenuated strain. A recovered cholera patient passes pathogenic vibrios for seven days, but after that they are entirely innocuous. If there were a quarantine for seven days of all cholera cases, it would be quite safe and the so-called endemicity of cholera would entirely disappear. Cholera is spread principally by religious pilgrimages all over the country. It is brought and spread by contact, flies, water, etc. In one case that was investigated it was found that one infected man spread the disease in forty-four villages within one week, and within two months five thousand people died. Marriage gatherings prove very bad foci for spread of the disease. The bazaar villages are great centers of infection. A pilgrim goes home, taking with him water from the Ganges River, and some food. Even if he himself has not the disease he may spread it through infected food and water. An outbreak in a Thibetan village had been traced to infected water carried a seventeen-day journey. In a village, when a man gets sick, the drinking vessels become at once infected and from these the well gets infected. Clothing becomes infected by mouth secretions and the excretae. In the hills the disease is often spread by the rivers. Cholera corpses are thrown into the rivers and streams, and it is almost impossible to chlorinate the streams. In the rivers where ceremonial bathing is indulged in the contaminated water is a great source of infection. Travelling parties going from the *melas* often infect wells in passing through villages, and railway carriages may be hotbeds of infection, where the travellers are packed so closely together. The Health Department's efforts to control the disease are nearly always treated with suspicion, which makes the work more difficult. The Department uses all sorts of propaganda, such as lantern slides, cinema films and lectures." Col, Dunn advises the use of potassium permanganate as a disinfectant, because the crystals are stable and therefore can be kept for a long time in a village, and

be ready whenever it is needed. If permanganate were placed in every well in a village, seven days later there would be no cholera there.

CHILD WELFARE MOVEMENT, A HOPEFUL SIGN

Among the most pressing problems of India's health is that presented by the appalling infant mortality. It is estimated that two million babies die every year while tens of thousands start life with the enormous handicap of child weakness the result of malnutrition imposed by poverty and ignorance. These conditions have stimulated the *Child welfare movement* initiated by the Lady Chelmsford and known as The Maternity and Child Welfare League, aided by the Indian Red Cross Society and the Indian Medical Service for Women. A network of child welfare centers have been established in the more populous areas. Lady Reading recent Vicerene and others, socially prominent, have with successful enthusiasm inaugurated Baby Week which has spread to the large towns all over India and promoted a persistent widespread effort among the European women and well-to-do Indian women. This child welfare movement includes maternity, pre-natal instruction to mothers and the training of Indian midwives. The Baby Week activities include the extensive campaign of demonstration and instruction in maternity activities throughout the country. It is hoped that the movement will continue to enlist increasingly intensive enthusiasm which will be necessary if the enormous field is to be successfully occupied. Already the movement has been productive of good results and if maintained with present enthusiasm will go a long way in solving the problem of the excessive mortality among India's infant and maternal population. It is a bright spot in the surrounding darkness of an otherwise pretty discouraging situation.

PUBLIC HEALTH REPORT

At present there is no health act for the whole of India nor under existing administrative arrangements is such an

act immediately probable, in anticipation of contemplated constitutional reforms.

Medical statistics according to the 1926 Government report for British India and the Indian states there were treated in the Government Civil hospitals and aided medical institutions numbering in all 4189 medical institutions, 44,610,196 patients of which 766,855 were indoor patients. In these institutions 1,871,495 surgical operations were performed.

MEDICAL EDUCATION IN INDIA

Medical schools existing in India are of two grades, (a) "*Medical Colleges*"—Medical departments of the universities, and (b) "*Medical Schools*."

In the former the Medical course is five years; two years of university premedical study being required, the combined degrees M.B. (Bachelor of Medicine) and B.S. (Bachelor of Science) are conferred. Twelve such colleges exist in British India and one in the Native State of Hyderabad. These colleges also admit women and there are in all 128 women in attendance. In addition there is also one Medical college of the M. B. B. S. grade exclusively for women, the Lady Hardinge Medical College in Delhi which has 113 students in training.

Medical Schools. Twenty-five such schools exist in British India and one in the Mysore state. Three of these are under mission auspices, two for women with 265 students and one for men with 60 students.

University Matriculation is required for admission in these schools. The course is four years, to be raised to five years in 1932.

These schools confer a license L.C.P.S. in Bombay (Licentiate College Physician and Surgeon) and L.M.P. Madras (Licensed Medical Practitioner).

In the colleges and schools there is a combined student enrollment of 10,181 medical students of whom 615 are women. The Zenana or purdah system is gradually being relaxed or is being modified under modern propaganda but there are still multitudes of women, especially among the Mohammedans in central and northern parts of India, who will not allow themselves to be treated by male doctors except for minor affections.

The need for women physicians both in the cities and villages is still very urgent in view of the prevailing social conditions, and the high mortality among infants and young motherhood.

The medical schools almost without exception are overflowing with students.

As compared with western countries some of the medical schools are insufficiently staffed and although there is an abundance of clinical material for teaching purposes it is not always adequately used.

The Calcutta School of Tropical Medicine is unique as being the only school of this kind in India. This school has an abundance of teaching material and is well equipped in respect of teaching staff and equipment. The course is for six months with the certificate D.T.M. (Doctor of Tropical Medicine).

CONCLUSIONS

1. The Government of India maintains an efficient medical service in India with 4189 medical institutions in British territory and 736 in the Indian States.

2. In the cities and large towns the number of medical practitioners is proportionally sufficient in numbers as compared with western countries but disease is more prevalent and mortality rates excessive, the result mainly of overcrowding and unhygienic surroundings.

3. The preponderance of medical practitioners in the large cities to the neglect of the rural areas, where 90 per

I wish it were possible, if we had the time to-night, to supplement Sir William's paper by pointing out the part he has played in bringing about the changes in methods of practice and the establishment of medical education of India. It was my privilege to be in the Miraj Hospital which he established, and to see what the establishment of this hospital has meant to the city and entire country-side. Everywhere you go in India, if you say "Miraj," it means "Wanless," and the other way around, "Wanless" means "Miraj." It is important that we bear in mind that the man who speaks so well of the present day practice of medicine in India, has himself played a very important part in the improvements which have been going on.

I have only a little time but I should like to say a few words about the India to which Sir William first went, and the practice of medicine there at that time and before.

As in the case of China, Indian medicine is very old. We have on record sacred books reaching back to 1500 B. C. We know that in the Orient, surgery was more highly developed in India than in any other country. The period of Brahman control, about 1000 to 800 B. C., was a period in which great progress was made in the methods of practice of medicine. It was then that the great figure of Ashoka lived. He is one of the six great figures of history, chosen by H. G. Wells (in his Outline of History) to represent that era, about 22 B. C. From his writings, it becomes clear that hospitals were founded by him, of a crude sort undoubtedly, but nevertheless they represented the beginning of the practice of medicine.

In the period of the fifth century A. D., we see Susrada, whose writings are a great storehouse of Indian surgery. Anatomy was being developed. To be sure, they gave fanciful names to anatomical structures and counted exact numbers of ligaments, nerves, etc., which are found in the human body. Still this marked the beginning of the conception of medicine as based upon anatomy. Similarly with physiology, they stated that there were seven cardinal

principles, and health consisted in a suitable proportion of these principles, and disease in a disproportion or break-up of the normal relationship.

Back in this fifth century A. D., Susrada's descriptions quite clearly give us a forecast of the relationship of malaria to the mosquito. That is worth bearing in mind. In other books there are warnings in this kind: "When rats shall fall from the ceiling and jump about and die, let the population beware and run away from the building." It is amazing to realize that hundreds of years before the development of the science of bacteriology and before the existence of bacteria was even guessed at, the foreshadowings of later days were seen by these men.

Indian therapeutics, like therapeutics in any other Oriental country, ranged from the days of spirits, when the gods did everything, down to the use of plants, of which thousands are described in the materia medica. Even more important is it that throughout this fifth century, medical writings included such subjects as diet, back-inhalations, gargles, blood-letting, and urethral and vaginal injections. At least there was a beginning of progress and we must remember that this had in it elements which have in their development had a great deal to do in pointing the way to modern developments to come.

I only spoke of this because I feel it so important to say once more to Sir William and to this audience, that we should be very grateful for Sir William's presence to-night, and should realize the share which he has had in bringing about the medicine in India to-day.

R. H. H. GOHEEN: I feel very much as Dr. Hume does, that it is quite unnecessary to add to what Sir William has said about present day conditions in India. Yet, having faced the situation in different parts of India for many years, I have in mind some things Sir William mentioned but did not particularly stress, and about which I should like to say a few words.

The work done at the Calcutta School of Tropical Medicine deserves high praise. The men working there have achieved great things. There is Sir Leonard Rogers, who gave us emetine which is a wonderful aid in the treatment of amoebic dysentery and amoebic abscesses. He also has helped in working out the modern treatment of leprosy. He and his assistant have developed the use of potassium iodide in large doses. This drug is not at all tolerated by the patient in the later stages of the disease. However, in the early stages, where there is a suspicious patch, if this spot is touched with potassium iodide, there is no reaction if it is not leprosy and a reaction if it is. And so on.

I want to mention in particular that very important disease, malaria, recognized by the Calcutta school as one of the most serious problems in India to-day. Sir Roland has proved that the anopheles mosquito transmits malaria, a very important proof indeed. In the last census, as Sir William pointed out to-night, it was found that about fifty million people died of malaria and kindred fevers in India every year. As he showed too, it is very difficult to obtain accurate figures in the remote villages, where all febrile conditions are classified as "fever." However, no other condition, except kala-azar which is not common, resembles malaria. Therefore it must be assumed that the majority of deaths included in this group of fifty million are truly malaria.

I also wish to say a few words further about tuberculosis. Sir William has given us the figures for Calcutta last year. While I was in charge of a tuberculosis sanatorium, I was asked to come up and talk to the Tuberculosis Association of Calcutta. We found that this disease has been increased in India in the past ten years by seventy-seven per cent, or over seven per cent per year. The only institution for combating the disease in Calcutta is a small dispensary started by an American woman, who had had experience in France during the war and in the rehabilitation of France subsequently. Her attention was drawn to

the conditions existing in Calcutta, and she started this dispensary.

Sir William's report is very important, because it draws attention to the prevalence of this disease. I really believe that the figures given are much too modest and that the disease is even more widespread. There is not one single sanatorium, apart from one having six beds and calling itself a sanatorium, in the whole of Calcutta. The only hopeful sign I see, is the establishment of a sanatorium on the outskirts of Calcutta which will have thirty beds, and which has already been started. The total bed capacity of all tuberculosis sanatoria in India does not equal that of the Municipal sanatorium in Chicago.

Add to the above what Colonel MacFerson told me last year, that the ratio of tuberculosis in the United Provinces is over seven thousand per one hundred thousand of population, as against nine hundred in the city of London. The increase in the disease is at the same rate in Bombay as in Calcutta, namely seven per cent per year. So that you can see that tuberculosis is another disease which must be very seriously considered in India to-day.

In conclusion, I should like to mention one more disease—carcinoma. In tropical countries, where people are largely by choice or force of circumstances, vegetarians, we would think carcinoma less prevalent than in the western countries. We were led to study the incidence of carcinoma among our own hospital patients, and found that among a total number of one thousand cases treated, the incidence of carcinoma was 2.88 or approximately 2.9. Figures given me for the Miraj Hospital were 3.19 or approximately 3.2, while Dr. Hume has given me the figures for the Post Graduate Hospital in New York. They were 3.2, 3.3, and 3.4, for the years 1926, 1927 and 1928. You can see, therefore, that there is very little difference. As you probably know there are certain areas in India where carcinoma of the cheek and mouth is extremely common due to the practice of chewing betel nuts; while in other dis-

tricts there is a different type due to excessive beating of the hips.

That is all I have to say to-night.

C. E. VAIL: Like Dr. Hume, I feel that I should spend my time to-night in speaking of Sir William, who is, of course, so much nearer to us in India. He has done a great work out there, and it has been my good fortune to be under his training. I do not wish to add anything to his comprehensive paper on present day medicine in India, but I should like to say a few more words on the subject of leprosy.

The treatment of this disease has been transformed in India during the last five years. To you, who rarely see a case of leprosy, it is a different proposition, than to one who sees a clinic every two or three days, in which there are four or five new cases not yet diagnosed. In former days we approached the problem of treatment of the leper as hopeless. While, during the past five years, we have cured more cases than in the previous twenty years.

Now, when we see a leper, we look on him in a different light. If he is an early case, we expect to cure him. You can understand the difference this makes to the leper himself. He formerly came to us, if he came at all, as an outcast, a man with no hope of cure. Now he comes to us for treatment, and not for isolation. So, in the near future we expect to know approximately how many lepers there are in India to-day. Now we are simply guessing, as Sir William pointed out. Probably there are five hundred thousand to one million lepers in India to-day, as estimated by Dr. Muir.

The reason for this guessing as to the number of lepers in India to-day, is that they are buried in the remote Indian villages where we cannot reach them. Now Dr. Muir comes to us and says the solution of this problem is to form centers for propaganda, survey, diagnosis and treatment. I think it is a great tribute to the insight and forethought

of Sir William Wanless that this is the system in use in the Miraj field.

We have five dispensaries in the outlying districts, with a graduate of the Medical School in charge of each dispensary. We coöperate with the Imperial Leprosy Relief Association of India, by sending our men to Dr. Muir for training, and having as assistants men trained by them so as to carry out intensive treatment, with the hope of curing the leper.

.So I would like you to look into the future of medicine in India with the hope that leprosy will be eradicated.

SIR HUMPHRY ROLLESTON'S LIFE OF ALLBUTT

The Right Honourable Sir Thomas Clifford Allbutt, K.C.B. A memoir by Sir Humphry Davy Rolleston, Bart, vi, 1 l., 314 pp., 8, London, Mac-Millan & Son, 1929. 15/.

F. H. GARRISON

Written for physicians by a physician about a physician, this is, in all probability, the best medical biography of the year. Its ornate, somewhat old-fashioned title suggests the remote post-Georgian day in which Allbutt was born; yet he not only lived through the World War period but well beyond it and, nigh to the age of ninety, remained, as always, fresh, rosy-cheeked, well-groomed, alert, sane, sound and up to the minute ("Yorkshire too"). He is thus, at once, very near to us and very far from us; for although, like Ambroïse Paré, witnessing the events of a century in the span of his life, he died, an old-fashioned gentleman in manner, but, in his modes of thought, an essentially modern man. In the year 1836, Victoria had not yet ascended the throne, the University of London was just beginning, Marsh was trying out his test for arsenic, the Webers were investigating locomotion, Bright had localized acute yellow atrophy of the liver, Sir Humphry Davy discovered acetylene, Cruveilhier, investigating phlebitis, was called to the first chair of pathology in the Paris Faculty and Boucher des Perthes had started to investigate the remains of prehistoric man. In 1925, Europe was beginning to recover from its war-wounds, while cholecystography, ventriculography, B. C. G., ultraviolet irradiation in rickets, insulin fattening and hyperventilation epilepsy were already known and Whipple and Robscheit-Robbins were experimenting with liver diet in pernicious anaemia. In less than 300 pages, Sir Humphry Rolleston contrives to tell all that is known of this long life, a quiet and uneventful one, be it said, and difficult to relate by reason of the utter lack of early records; for Allbutt, his biographer tells us, kept very few records, did not write a diary or leave any published reminiscences, and very few of his early contemporaries are now alive." Boyhood in Yorkshire and

Suffolk vicarages, school-days at York, B.A. (1859), M.B. (1861) and M.D. (1869) at Cambridge, a year in Paris with Trousseau, Duchenne, Hardy and Bazin (1860), twenty-eight years practice at Leeds (1861-89), marriage (1869), Commissioner in Lunacy (1889), Regius Professor of Physic at Cambridge (1892-1925), foreign travel, Alpine climbing, lecturing in America, clinical investigation, and most incomparable writing—that is all there is to Allbutt's life, and yet its simple story is alluring from end to end. It is the story of one in whom the grand old name of gentleman suffered no abjection or abasement, who was, *comme caractère*, one of the best and kindest men who ever lived, one of the ablest of modern clinicians, whose religious feeling was deep because unostentatious, yet endowed with the proverbial Yorkshire keenness and practising literature as a fine art, with the single exception of Huxley, perhaps the most original English writer in our profession. In his childhood, he knew Charlotte Brontë, had seen the other sisters, and describes Charlotte as dull and insignificant as "the lamp-bracket which holds the light," Emily as "gey ill to live wi," Anne as tame and imitative, Patrick as "a bad egg," and otherwise "just negligible, save as a thorn in other people's flesh." Of Emily's *flair* for the wild and monstrous (in *Wuthering Heights*), he says: "These folk have some uncanny insight, a Cuvier-like faculty of *ex pede Herculem*." His student reminiscences of Trousseau and Duchenne are equally vivid. In September, 1868, George Eliot described Allbutt as "a good, clever and graceful man, enough to enable one to be cheerful under the horrible smoke of ugly Leeds." In August, 1869, she was beginning *Middlemarch*. It is no secret that much of Allbutt went into Lydgate, although he always "observed a somewhat sphinx-like expression" about it. His was, in fact, the logical opposite of a life drained to extinction by a basil-plant. Jocund and content in his family life, he described the frequent reunions of his domestic foursome (Lady Allbutt, his adopted daughter, his sister and himself) as "our family square."

Allbutt was a pioneer in the open air treatment of fevers (1865-6) and in the employment of the ophthalmoscope in internal disorders (1867-71); he introduced the short, handy clinical thermometer, in other words, brought the instrument into general use (1867); he first described syphilis of the cerebral arteries (1862-72; Heubner, 1874), the first case of Charcot's tabetic joint lesion in England (1869); he was the first to note the role of mental anxiety in the causation of renal (better cardio-renal) disease (1876), was a great authority on all phases of disorders of the circulation and, in 1894-5, ascribed angina pectoris to aortic lesion (Corrigan, 1837) and isolated hyperpiesia or "senile plethora" as essential arterial hypertension of non-renal or non-arteriosclerotic origin. Twenty years before Charcot, Allbutt noted that disease of the most disparate type may be widely distributed in space and time, among a given patient's ascendants, descendants and relatives, usually pivoting around the purpuras and polymorphic erythemas as serial members of the gouty, rheumatoid, neurosyphilitic or tubercular diatheses (1867). Patients are thus, as Charcot affirmed, "only an accident" in the familial distribution of a major disease in space and time, like individual members of a finite mathematical series. This is the basic thought in Allbutt's three essays on classification of diseases (1867, 1888, 1906), the most original ever written on the subject, demolishing the false notion of a "clinical entity" by stressing the patient as the real thing, and pregnant with the medicine of the future. In keeping with all this was his unrivalled clinical approach, as described by one of his colleagues:

"His bedside manner could never have been surpassed. . . . He was always hopeful, even in the most hopeless cases and always left the patient with the feeling that not only was there considerable cause for hopefulness, but that the patient was the one person and the one case in which Dr. Allbutt was specially interested. It is needless to say that all the most desirable of the general practitioners were both happy and proud to meet him in consultation. He never let a man down."

In the beautiful sentences expressing his love for music, Allbutt seemed, in fact, to be describing the effect of his

own benign personality: "So the master came; appearing and disappearing like a wraith, but a wraith under a radiant halo of illumination. He lifted us up in an organ glory which none of us had known, before or since." During his Leeds period, Allbutt realized an income of £4000-£6000 a year. It came to be said in professional circles that "no good Yorkshireman would rest quietly in his grave if, before his death, he had not been seen by Clifford Allbutt." His teaching in the wards is described as "a series of exquisite thumb-nail clinical lectures." Examples are his views on overwork of the heart, and athletes gone stale, his rule for stopping thrombosis in typhoid fever (communicated to Thayer, 1925), his sympathy with dunces ("our vacuous minds") and his suspicion of juvenile prodigies, his use of morphine in cardiac dyspnoea, his "large basin of really good bouillon and then tumble into bed" for overstrained Alpine climbers and his sound reasoning about the athletic monomania, the sexual prurency and the mechanized sexuality of our present period. "Tenderness, gratitude, love are more to us than two arms, two legs or two lungs; moreover the higher gifts of the imagination may be found in the frailest or the humblest vessels." In the history of medicine, Allbutt stands quite alone, as the most original, informing and suggestive of all English writers on the subject. To make an anthology of his best essays on medicine and its history, as Maude Abbot proposes for Osler, would seem a fitting and desirable pendant to a biography so thoughtfully conceived and so happily executed.

Allbutt's letters to me were the most encouraging I have received in life and I shall never forget the great hearted gentleman who wrote them. *Omne individuum ineffabile.*

EPIDEMIC ENCEPHALITIS

Review of the book on *Epidemic Encephalitis*
Representing the Report of a Survey by the Matheson Commission

MICHAEL OSNATO

This survey was made under the supervision and direction of a commission, under the chairmanship of Dr. William Darrach. The members were:

Dr. Haven Emerson	Dr. Charles R. Stockard
Dr. Frederick P. Gay	Dr. Frederick Tilney
Dr. William H. Park	Dr. Willis D. Wood
Dr. Hubert S. Howe, Secretary	

Dr. Josephine B. Neal, Director of the survey, was assisted by Dr. Helen Harrington, epidemiologist.

The book consists of 849 pages, the last 449 of which contain a very extensive, beautifully catalogued literature of the subject, which, in itself, justifies the activities of this commission.

The bibliography was prepared by Jean N. Baker, the chapter on epidemiology by Dr. Helen Harrington, and the chapters on post-vaccinal encephalitis, etiology and treatment by Dr. Josephine B. Neal.

The work of many clinicians and laboratories in Europe was investigated and correlated with the work which has been going on in the United States.

The book is divided into three main chapters, Etiology, Epidemiology, and Treatment.

The chapter on etiology takes up the whole question from the first suspicions of two English observers, Dr. Arthur J. Hall and Dr. Wilfred Harris, that the cases presented points of similarity to the clinical picture of "botulism", down to the latest work of Drs. H. Zinsser and S. Flexner.

In spite of the vast amount of work which is carefully reviewed in these 104 pages devoted to etiology, there are

still widely varying opinions in regard to the causes of epidemic encephalitis. In detailing the work of a host of authors, the errors which led them to their incorrect conclusions are probably explained by the sub-chapter, beginning on page 24, which thoroughly discusses the question of spontaneous encephalitis in rabbits. The work of Levaditi, and the co-workers of Von Economo, many Italian and French authors, Loewe, Strauss and Hirshfeld, is thus sympathetically forgiven. It was the merit of the careful check-up studies of Flexner and the Rockefeller Institute group, including Amoss, to point out that a little more than one-half of all the rabbits with which they worked, suffered from spontaneous encephalitis, and that the clinical and microscopic findings and the cultural data in these cases, were quite similar to those reported by Strauss, Loewe, Thalheimer, and others. The articles published by Rosenow in which he concluded that there was a close relationship between epidemic hiccough, epidemic encephalitis and poliomyelitis, are also carefully reviewed, as is also the entire question of filtrable viruses. The portion devoted to viruses closely allied to or identical to the herpes virus, is especially well done. The present state of our knowledge of the cause of epidemic encephalitis cannot be better expressed than in the words of Drs. Zinsser and Flexner, who are quoted on page 104:

“Zinsser has been working with a species of monkey in which it is possible to produce both an acute and a subacute encephalitis by means of herpes virus. The details of these experiments are in press. On the basis of this work and his immunological experiments, he states that he is gradually moving in the direction of the view that since encephalitic disease is chiefly secondary to filtrable virus conditions, most of these agents may become neurotropic under circumstances of individual susceptibility, and that the difficulty of transferring to animals is very possibly due to a gradual loss of virulence consequent upon the prolonged nature of the cases which usually come to our hands at autopsy.’”

However, this subject cannot be left without a few words concerning the chapter on post-vaccinal encephalitis which has been fairly prevalent in England and on the Continent, especially in Holland. In this chapter also are discussed the encephalitides following measles, variola, mumps, influenza and other acute infections. According to some of the authors quoted, these types of encephalitis may be differentiated quite definitely from epidemic encephalitis and poliomyelitis, both clinically and histologically. This is particularly true of the vaccine virus encephalitis. Lucksch, Levaditi and Nicolau, Blanc and co-workers, were apparently the first to demonstrate the vaccine virus in the brains of three rabbits, after vaccination. Levaditi and his co-workers believed that the post-vaccinal encephalitis is produced by some agent other than the vaccine. The reasons for this were that clinically, post-vaccinal encephalitis resembles the epidemic form and that there are striking resemblances in the pathology. Further points of similarity between post-vaccinal encephalitis and the epidemic form he mentions are, that inoculations in rabbits have all been negative in showing the presence of the virus. The morbidity is the same. Vaccination in the rabbits facilitates the localization in the nervous system of the herpetic, encephalitic virus. Levaditi's conclusions are that post-vaccinal encephalitis may be due to an awakening by the vaccination of a latent encephalitic infection.

This discussion is interesting in view of a recent article by Levaditi published in the *Archives of Neurology and Psychiatry* for October, 1929, Volume 22, No. 4, page 767. If the reviewer may be permitted to refer to this article which is not discussed in the book which he is reviewing, it is interesting to note that Levaditi now believes that the encephalitis following herpes, post-vaccinal encephalopathy, rabies and epidemic encephalitis, can best be explained on the Unicist theory which, in his opinion, is the only one that fits the experimental data. This work of Levaditi, which he reports in detail, is being supported by the Matheson Foundation. Levaditi, however, quite

definitely feels that epidemic encephalitis and epidemic poliomyelitis are two etiologically different infectious processes, although they are caused by ultra-viruses belonging to the same group of neurotropic ectodermatoses.

The second chapter is that of Treatment and one can perhaps most readily obtain an idea of the status of the treatment of this condition by referring to a few of the many things tried or recommended. These vary from acriflavine to inoculation with African recurrent fever and malaria. This host of drugs and other remedies include also the convalescent serum and the serum of Rose-now, and all of these things have been equally inefficacious.

The chapter on Epidemiology begins with a very interesting historical account. It has not been definitely proved that epidemic encephalitis, as we know it, existed prior to the outbreak of the so-called Australian Disease of 1917-1918. Prior to this in April and May, 1915, in Rumania, the condition reported by Obregia, Urechia and Carniol, as hemorrhagic encephalitis caused by encapsulated diplococcus, may possibly have been the first recorded cases of epidemic encephalitis. Very rapidly now cases were reported in France, in April, 1917, and by Von Economo in Vienna in January and May, 1917. The French cases began in 1915 and 1916 but were reported a year later. Von Economo was the first to apply the term encephalitis lethargica. Cases then appeared in Austria, Germany, Poland, then in England, Switzerland, and so on. The epidemic early in 1918 was followed by one in 1919 which was especially prevalent in England and France. Other epidemics followed in 1920, which were especially severe in Poland, Switzerland and Italy. These were followed by the pandemic of 1920. The peak was reached in this year and there was a general decline in 1921 with a peak, however, in Norway and Sweden, Finland and Belgium. The severity declined even more in 1922 and 1923, but a second peak was reached in the pandemic of 1924. In this year it was most severe in the British Isles and Ireland. No important outbreaks have

occurred since 1924 and the League of Nations Monthly Epidemiological Report is sponsor for the statement that epidemic encephalitis seems to have lost its epidemic character, for, at least for the time being, its incidence has decreased in all countries in recent years and its seasonal fluctuation has almost disappeared. The death rate for the period 1921 to 1926, per 100,000 inhabitants, in the British Isles, was about 2.5. There now follows, beginning page 188, a very interesting and beautifully done series of statistical studies dealing with age, sex, occupation and race. From these studies it would appear, first, that young adults are more susceptible, and secondly, that the disease occurs more commonly in the male. These studies also prove that there is no indication of any connection between occupation and liability to infection. Race seems to have little influence, although the report states that in the United States the negro has not proved to be especially susceptible to the disease.

The mortality statistics vary from the low of Happ and Mason's series of 81 cases namely, 7.4 per cent, to those of Butt, of South Africa, of 92.3 per cent (13 cases). The intermediate figures are more often quoted, but of 7,876 cases collected from the literature by the Survey, there were 3,980 deaths namely, 50.53 per cent.

The studies on communicability show that there is hardly any evidence of contagion in any country in which the disease has occurred. While this is the general experience, there are some men, for instance, like Netter, who thought he had determined eight clear cases of contagion out of 174 cases studied (4.6 per cent). Many isolated cases of apparent contagion are quoted. Hall describes one case of transmission from mother to new born baby, and Bompiani and Shuman report cases in which infants were born of mothers suffering from epidemic encephalitis, who died, one three days, and the other thirty-six hours after birth, with suggestive symptoms.

Extensive epidemiological studies are quoted from the British Isles, Italy, Holland, Germany, Czechoslovakia,

Rumania, Bulgaria, Russia, Spain, Portugal and the United States. The earliest cases made their appearance on the Continent during the Winter of 1916-1917, in the United States in September, 1918. Studies perhaps not so extensive are also quoted for India and China. Most extensive studies are recorded for Japan, where the first cases were noted in December, 1919. The study of the epidemiology of the condition in Australia, where it was known as the "Mysterious" or "X-disease," is quite interesting.

Following this chapter is the very extensive and very carefully prepared bibliography which we have already mentioned.

The reviewer feels that the work of the Commission has been thoroughly and well done, and while the cause of epidemic encephalitis is still unknown, at least our knowledge of it has been brought up to date, and more important perhaps than this is that it may be through the agency of the Commission, that various workers on the Continent and in this country, have had their activities coördinated and stimulated in such a way that there is every reason to believe that the most important developments may be expected in the next few years.

AWARD OF THE ACADEMY MEDAL

The first award of the Academy Medal for unusually meritorious work in medicine, was made to Dr. Carl Koller of New York City at the Annual Meeting of the Academy held on January 2, 1930.

The citation reads as follows: Distinguished ophthalmologist; able in the field of biology; painstaking in research; discoverer of the anesthetic properties of cocaine; inaugurator of the era of local anesthesia, conferring upon humanity an enormous relief from suffering; a Fellow of this Academy since 1898; in recognition of his services is awarded the first Academy medal.

In accepting the medal Dr. Koller said: "I do not think I can adequately answer the generous words you have spoken to me. I feel especially honored to be the first recipient of this medal. It is for me a great satisfaction that I have lived to see universal good which the further development of local anesthesia has worked in the course of the years. I deeply appreciate your generous thought in singling out my work for this medal."

RECENT ACCESSIONS TO THE LIBRARY

- Adler, A. The science of living.
N. Y., Greenberg, [1929], 264 p.
- Association for research in nervous and mental disease. The cerebellum.
Balt., Williams, 1929, 649 p.
- Association for research in nervous and mental disease. The intracranial pressure in health and disease.
Balt., Williams, 1929, 519 p.
- Bauer, J. Der sogenannte Rheumatismus.
Dresden, Steinkopff, 1929, 142 p.
- von Behr-Pinnow, C. Menschheitsdämmerung?
Berlin, Stilke, 1929, 156 p.
- Bennardi, A. M. Replacement treatment in advanced age.
Boston, Christopher Pub. House, 1929, 56 p.

- Boole, E. A. Give prohibition its chance.
N. Y., Revell, 1929, 190 p.
- Burr, A. R. Weir Mitchell; his life and letters.
N. Y., Duffield, 1929, 424 p.
- Cameron, H. C. The nervous child. 4. ed.
London, Milford, 1929, 249 p.
- Chemnitzius, F. Die Chemie in Jena von Rolfinck bis Knorr.
Jena, Biedermann, 1929, 191 p.
- Crowther, J. A. Ions, electrons, and ionizing radiations. 5. ed.
N. Y., Longmans, 1929, 353 p.
- Drennan, M. R. A short course on the mechanism of voice and speech.
Capetown, Elford, 1929, 67 p.
- Durville, H. Der Fluidalkörper des lebenden Menschen. 2. Aufl.
Leipzig, Altmann, 1929, 258 p.
- Edmonds, C. R. and Walker, G. K. Diseases of animals in tropical countries. 2. ed.
London, Baillière, 1929, 407 p.
- Einhorn, M. Diseases of the stomach. 7. ed.
N. Y., Wood, 1929, 593 p.
- Fauss, W. Die Natur- und Kunstzähne des Menschen.
München, Schreiber, 1928, 160 p.
- Fisher, H. A. L. Our new religion.
London, Benn, 1929, 191 p.
- Fred, E. B. and Waksman, S. A. Laboratory manual of general microbiology.
N. Y., McGraw-Hill, 1928, 145 p.
- Gudzent, F. Die Radiumtherapie; Methoden und Aussichten.
Dresden, Steinkopff, 1929, 106 p.
- History of Blockley; a history of the Philadelphia General Hospital.
Phil., Davis, 1929, 765 p.
- Holmes, A. The mind of St. Paul.
N. Y., Macmillan, 1929, 263 p.
- Jones, (Sir) R. and Lovett, R. W. Orthopedic surgery. 2. ed.
N. Y., Wood, 1929, 807 p.
- von Korányi, A. (baron). Vorlesungen über funktionelle Pathologie und Therapie der Nierenkrankheiten.
Berlin, Springer, 1929, 330 p.
- Kuckuk, W. Das Herz in gesunden und kranken Tagen.
Recklinghausen, Visarius, [1929], 111 p.
- Liddell, E. G. T. and Sherrington, (Sir) C. S. Mammalian physiology.
Oxford, Clarendon Pr., 1929, 162 p.
- Loewenberg, S. A. Diagnostic methods and interpretations in internal medicine.
Phil., Davis, 1929, 1032 p.
- Macdonell, (Sir) J. Historical trials.
London, Milford, [1928], 234 p.

McPheeters, H. O. Varicose veins, with special reference to the injection treatment.

Phil., Davis, 1929, 208 p.

Mongiardino, T. Manuale di farmacologia comparata degli animali domestici.

Torino, Unione Tipografico-Editrice Torinese, 1929, 594 p.

Neue Dokumente zur Menschenheitsgeschichte.

Weimar, Verlag für Urgeschichte und Menschforschung, 1928, v. I.

Nobel, E.; Pirquet, C. and Wagner, R. The nutrition of healthy and sick infants and children. 2. ed.

Phil., Davis, 1929, 243 p.

Nordmann, O. Cirugía práctica.

Barcelona, 1929, 794 p.

Physikalischen (Die) Heilmethoden im Dienste der Krankenversicherung.

Leipzig, Voss, 1930, 265 p.

Pierce, S. W. and Pierce, J. T. The layman looks at doctors.

N. Y., Harcourt, [1929], 251 p.

Quigley, D. T. The conquest of cancer by radium and other methods.

Phil., Davis, 1929, 539 p.

Roberts, H. F. Plant hybridization before Mendel.

Princeton, Princeton Univ. Pr., 1929, 374 p.

Rolleston, (Sir) H. D. The Right Honourable Sir Thomas Clifford Allbutt, K.C.B.

London, Macmillan, 1929, 314 p.

Ruge, R.; Mühlens, P. and zur Verth, M. Krankheiten und Hygiene der wärmen Länder. 3. Aufl.

Leipzig, Thieme, 1930, 494 p.

Smith, (Sir) F. A manual of veterinary physiology. 5. ed.

London, Baillière, 1921, 892 p.

Smoot, G. A. The law of insanity.

Kansas City, Mo., Vernon Law Book Co., 1929, 635 p.

Textbook (A) of the practice of medicine. Edited by Frederick W. Price. 3. ed.

London, Milford, 1929, 1871 p.

Thorndike, L. Science and thought in the fifteenth century.

N. Y., Columbia Univ. Pr., 1929, 387 p.

Trial (The) of Herbert John Bennett.

London, G. Bles, 1929, 216 p.

Washburn, B. E. Jamaica health stories and plays.

Kingston, Gov. pr. off., 1929, 110 p.

PROCEEDINGS OF ACADEMY MEETINGS

JANUARY

ANNUAL MEETING

Thursday Evening, January 2, at 8:45 o'clock

ORDER

- I. EXECUTIVE SESSION
 - Reading of the Minutes
 - Election of Fellows and Honorary Fellows
 - Special election—Committee on Admission
- II. Award of Academy medal—Carl Koller
- III. Annual reports
 - The Council, John A. Hartwell
 - The Trustees, Eugene H. Pool
 - The Treasurer, Seth M. Milliken
 - The Sections, Edwin Beer
 - Committees: Admission, Arthur M. Wright; Library, Russell L. Cecil; Public Health Relations, James Alexander Miller; Medical Education, Nellis B. Foster; International Medical Relations, Samuel J. Kopetzky; Professional Standards, Samuel W. Lambert; Medical Jurisprudence, Israel Strauss; Honorary Fellowship and Honors, B. Sachs; Activities, Walter L. Niles

Thursday Evening, January 16, at 8:30 o'clock

THE FOURTH HARVEY LECTURE

Acquired immunity in syphilis, Alan M. Chesney

Associate Professor of Medicine, Johns Hopkins School of Medicine
Baltimore

G. CANBY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for January.

SECTION OF SURGERY

Friday Evening, January 3, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. 1. Anterior dislocation of the sterno-clavicular joint. Operative correction
 2. Garre's osteo-sclerosis of the metacarpal bone
 3. Spontaneous rupture of flexor tendons following operative repair. Secondary operation

4. Contracture of axilla following burns; a method of skin transplantation. Two cases, John H. Garlock
 - b. 1. Dislocation of index finger at metacarpo-phalangeal articulation.
Operation
 2. Vertical fracture of patella, Paul A. Dineen
- III. PAPER OF THE EVENING
Acute pancreatitis, Ralph Colp
- IV. GENERAL DISCUSSION

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, January 7, at 7:45 o'clock

ORDER

- I. PRESENTATION OF PATIENTS
 - a. Cases from the Cornell Clinic
 - b. Cases from the Beth Israel Hospital
 - c. Cases from the Polyclinic Hospital
- II. MISCELLANEOUS CASES.
- III. DISCUSSION OF CASES
- IV. EXECUTIVE SESSION

NOTE: Examination of cases is limited to members and their invited guests.

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, January 8, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. Notes on increased interest in medical history, C. N. B. Camac
 - b. An historical review of the relationship of medicine to pharmacy.
Illustrated by lantern slides, Curt P. Wimmer (by invitation)
 - c. The value of medical history in undergraduate schools, Howard W. Haggard (by invitation)
- III. GENERAL DISCUSSION

SECTION OF PEDIATRICS

Thursday Evening, January 9, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Encephalitic changes in so-called "toxicosis of infants," Max A. Goldzieher (by invitation)
Discussion, Herman Schwarz, Joseph Globus
 - b. A possible explanation of horse serum anaphylaxis in man, Bret Ratner
Discussion, William H. Park

- c. The carbohydrate metabolism of the ...
Greenwald (by invitation)

Discussion

- d. Urinary calculi in infancy and childhood ...

Discussion, A. R. Stevens

SECTION OF OTOLARYNGOLOGY

Friday Evening, January 10, at 8:30

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
Case of objective ear noises, Alfred Schattner (by invitation)
- III. REPORT OF CASES
Case for diagnosis, Louis K. Pittman (by invitation)
- IV. PAPER OF THE EVENING
An estimation of Wittmaack's work on the labyrinth (by invitation)
- V. EXECUTIVE SESSION

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SECTION OF NEUROLOGY AND PSYCHIATRY

Joint Meeting with the
NEW YORK NEUROLOGICAL SOCIETY

al one

Tuesday Evening, January 14, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION
Clinical and pathological report of an unusual case of ...
spasm. Lantern slides, S. Philip Goodhart, Charles D. ...
(by invitation)
Discussion, Smith Ely Jelliffe, Joshua Rosett, Israel Wechsler,
and D. Friedman
- III. PAPERS OF THE EVENING
 - a. The histopathology of experimental diabetes insipidus, F. J. W. ...
(by invitation)
Discussion, Smith Ely Jelliffe, Irving H. Pardee, Charles D. ...
S. Philip Goodhart
 - b. The legend of the prevention of mental diseases, I. S. Wechsler
Discussion, Smith Ely Jelliffe, A. A. Brill, J. Ramsey Hunt,
and Wood E. Williams
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

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SECTION OF GENITO-URINARY SURGERY

Program presented by

STAFF OF UROLOGICAL DEPARTMENT

Bellevue Hospital

Wednesday Afternoon, January 15, at 2:00 o'clock

Amphitheatre Bellevue Hospital

("K" Building)

A. Operations by Urologic Staff

- B. 1. Demonstration of the Elliott thermo-hydro-therapy, Max S. Rohde
2. (a) Persistent hematuria originating in a traumatic kidney
(b) Hematuria due to renal hypernephroma and hypertrophy of prostate, J. J. Valentine
3. Roentgenographic evidence of urological conditions in children, M. F. Campbell
4. (a) Demonstration of cystoscopic use of the electrotome
(b) New cysto-uretroscope, C. W. Collings
5. Presentation of three cases with ureters implanted in large bowel, A. R. Stevens

SECTION OF GENITO-URINARY SURGERY

(Continued)

Wednesday Evening, January 15, at 8:30 o'clock

ACADEMY OF MEDICINE

ORDER

I. READING OF MINUTES

II. PRESENTATION OF CASES

- a. High ureteral obstructions. Lantern slides, A. R. Stevens
b. Calculous disease of the upper urinary tract. Lantern slides, C. W. Collings
c. Peri-renal abscess, M. F. Campbell
d. Five years' experience with vaso-ligation in prostatic obstruction, G. A. Cashman (by invitation)
e. Foreign bodies in the urethra. Report of case, H. S. Jeck
f. Diverticuli of bladder, containing calculi, W. H. McNeill, Jr.
g. Motion pictures as an aid in teaching Urology, J. J. Valentine
h. Intravenous pyelography—ureterography—cystography, M. Swick (by invitation)

III. GENERAL DISCUSSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, January 17, at 8:30 o'clock

ORDER

I. READING OF MINUTES

II. PAPER OF THE EVENING

The operative lengthening of the tibia and fibula, illustrated with motion pictures, LeRoy Abbott, St. Louis (by invitation)

III. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, January 20, at 8:30 o'clock

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Unusual muscle findings after frontal sinus operation, James Watson White
- b. Bilateral spasm of superior rectus muscle, Francis W. Shine
- c. A case of optic atrophy in Paget's disease (with lantern slides), Rudolf Aebli (by invitation)
- d. Pulsating exophthalmos traumatic, Henry H. Tyson
- e. A tumor of the optic nerve, Thomas Johnson
- f. Partial optic atrophy, Webb W. Weeks

III. DEMONSTRATION

Stereoscopic photography as applied to the eye, Wendell L. Hughes

IV. PAPER OF THE EVENING

Herpes zoster ophthalmicus luetica, Irving H. Pardee

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

SECTION OF MEDICINE

Joint meeting with the

NEW YORK DIETETIC ASSOCIATION

Tuesday Evening, January 21, at 8:30 o'clock

ORDER

I. PAPER OF THE EVENING

Some chemical aspects of nutrition, Lafayette B. Mendel, Yale School of Medicine (by invitation)

II. DISCUSSION, Eugene F. Du Bois, Graham Lusk, Henry C. Sherman (by invitation)

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, January 22, at 8:30 o'clock

ORDER

I. READING OF MINUTES

II. PAPERS OF THE EVENING

- a. Unusual rhino-laryngological conditions and their treatment (lantern slides), Gordon B. New, Mayo Clinic (by invitation)

Discussion, John E. Mackenty, Samuel McCullagh, John D. Kernan, Henry B. Orton

- b. Agranulocytic angina (lantern slides), Nathan Rosenthal (by invitation)

III. PRESENTATION OF CASES

- a. Vascular fibroma of a teratomatous nature, of the nasal cavity and naso-pharynx, John E. Mackenty
- b. Adamantinoma of mandible, duration 18 months, operation, recovery, demonstration of specimen, Morley T. Smith
- c. Third nerve paralysis, associated with posterior ethmoiditis and sphenoiditis, improvement following operation, John D. Kernan
- d. Abscess of frontal lobe simulating frontal sinusitis, presentation nine years after operation, Francis W. White
- e. Carcinoma of neck extending through thyroid cartilage, second showing of case, Arthur S. Wilson
- f. Plasmocytoma of the nose, Harry Rosenwasser (by invitation)

IV. REPORT OF CASES

- a. 1. Carcinoma of right ethmoid, antrum and sphenoid sinuses. Follow up on case presented one year ago
- 2. Carcinoma of larynx (lymphoid epithelioma) primary lesion well three years, following radium treatment. During past three months metastases to right forearm and left ankle, G. Allen Robinson

Discussion, David H. Jones

- b. Pemphigus with initial lesion in pharynx, Louis Hubert

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, January 28, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

- a. Studies on the pupillary reactions of pregnant and non-pregnant women and their practical application in the diagnosis of pregnancy, Z. Bercovitz (by invitation)

Discussion, Mortimer M. Hyams, Adolph Jacoby, Gerard L. Moench

- b. Trichomonas vaginalis vaginitis, Sophia J. Kleegman (by invitation)

Discussion, H. Dawson Furniss, Frederick C. Holden

III. GENERAL DISCUSSION, James H. Movitz, Adolph Jacoby, Mortimer M. Hyams, James V. Ricci, Julius Kurzrock, Samuel J. Scadron

IV. EXECUTIVE SESSION

NEW YORK MEETING
of the
SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE
under the auspices of
THE NEW YORK ACADEMY OF MEDICINE
Fifth Avenue and 103rd Street
Wednesday, January 15, at 8:15 o'clock

- I. The polynuclear count in the rat, with special reference to vaginal smears, J. F. Yeager, H. O. Haterius (introduced by Eric Ponder)
- II. Gastric hypersecretion following parturition in a dog, F. Hollander (introduced by I. S. Kleiner)
- III. Effects of high voltage cathode rays upon germinal epithelium of the rat, V. C. Jacobsen
- IV. A further report on the effect of thyroparathyroidectomy on the action of irradiated ergosterol, A. F. Hess, M. Weinstock, H. Rivkin
- V. Agglutination changes in ageing germ cells, A. J. Goldforb
- VI. The extraction of tyrosinase from mutants of *drosophila melanogaster*, M. A. Graubard (introduced by L. C. Dunn)

PETTON ROUS, President

A. J. GOLDFORB, Secretary

NEW YORK PATHOLOGICAL SOCIETY
In Affiliation with
THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, January 23, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Bile acids, bile pigment and cholesterol in A, B and C fractions of bile, J. C. Browne (by invitation), I. Katayama (by invitation)
 - b. Diurnal variations in blood and cholesterol in health and disease, L. Halpern (by invitation), I. Somach (by invitation)
 - c. Chlorides of gastric contents in hypochlorhydrias and hyperchlorhydrias, K. Eyerly (by invitation), J. A. Killian (by invitation)
 - d. A case of fulminant infection with the Pfeiffer bacillus, Adele E. Sheplar (by invitation), Lawrence Sophian (by invitation), W. J. MacNeal
 - e. Some observations on the bacillus of Ducrey, Adele E. Sheplar (by invitation), W. J. MacNeal
 - f. The influence of environmental factors on the behavior of *Echerichia coli* and its specific bacteriophage in urine, Frances C. Frisbee (by invitation), W. J. MacNeal
 - g. Relation of the epithelium to the mucosa in pachydermia laryngis, Louise H. Meeker

- h. Reconstruction study of the follicles and follicular arteries of the human spleen, W. J. MacNeal, J. M. Ravid (by invitation)
- i. A histological study of sacro-coccygeal chordoma, Nicholas M. Alter, Lawrence Sophian (by invitation)
- j. The mucus-secreting cylindrical cells of the lining of the urinary tract, Nicholas M. Alter

II. EXECUTIVE SESSION

Annual election of officers

HARRISON S. MARTLAND, President, Newark City Hospital

BERYL H. PAIGE, Secretary, The Presbyterian Hospital

ELECTION OF OFFICERS

ANNUAL ELECTION

Thursday Evening, December 5, 1929

The following nominees were elected in accordance with By-law XX:

Vice-President, 3 years, Lewis A. Conner; Treasurer, 3 years, Seth M. Milliken; two Trustees, 5 years, James F. McKernon, George D. Stewart; Committee on Library, 5 years, Alfred E. Cohn; one member, Committee on Admission, 3 years, Emanuel D. Friedman; one member, Committee on Admission, 1 year, Ward J. MacNeal.

SPECIAL ELECTION

Thursday Evening, January 2, 1930

The following nominees were elected in accordance with By-law XX:

Three members of Committee on Admission, 3 years, George M. MacKee, Harry M. Imboden, Alfred T. Osgood.

FELLOWS ELECTED FEBRUARY 6, 1930

Lester Breidenbach.....	323 East 87th Street
Robert L. Carswell.....	1 Park Avenue
Evelyn Holt.....	56 East 89th Street
James Wainwright Howard.....	116 East 53rd Street
Archibald Malloch.....	2 East 103rd Street
William Schroeder, Jr.....	184 Joralemon St., Brooklyn
Frank Raymond Smith.....	107 East 67th Street

AND FOR ASSOCIATE FELLOWSHIP

Edgar Sydenstricker, M.A.....	49 Wall Street
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C. FLOYD HAVILAND

(From "Mental Hygiene," January, 1930)

"Dr. C. Floyd Haviland was born on August 15, 1875, in Spencertown, New York, the son of Dr. Norman H. Haviland and the late Mrs. Henrietta Newman Haviland. The family later moved to Fulton, New York, where Dr. Haviland attended the public schools, graduating from the high school in 1893. He received his medical education at the Syracuse Medical School, obtaining his degree in 1896."

Immediately after graduation Dr. Haviland joined the staff of the Manhattan State Hospital. His entire professional life was spent in the mental hospitals of his native state.

"In 1921, Dr. Haviland became medical member and chairman of the New York State Hospital Commission, in which position he continued until he resigned on July 1, 1926, to become superintendent of the Manhattan State Hospital. At the end of Dr. Haviland's service as head of the State Hospital Commission, it was remarked that his period of service had covered an epoch in the development of the state system in the care and treatment of the mentally diseased, and in no equal period of time since the passage of the State Care Act in 1890 had so many progressive measures been taken by the commission. In his position as chairman and chief executive of the commission, Dr. Haviland had had two purposes continually in mind: first, the improvement of the state hospitals, so that more patients might recover or improve; second, the prevention of mental diseases, so that fewer patients would need state-hospital treatment. For the accomplishment of the first of these purposes, during his service as a commissioner action was taken toward organizing and developing occupational therapy in all of the state hospitals; a medical survey of the state hospitals was made, the medical services were placed on a more uniform and efficient basis, and diagnostic clinics in several of the state hospitals were organized; a survey of nursing and of the schools of nursing in the state hospitals was made, and steps were taken to strengthen and improve their service and to provide better courses of instruction for both nurses and attendants; as a result of the approval of the bond issue for fifty million dollars for state institutions, a comprehensive building program to remove overcrowding and to provide better facilities for patients was undertaken; two new state hospitals and a veterans' memorial hospital were built, and extensive development was carried on in the institutions previously begun at Marcy and Creedmore; for protection from fire in the state hospitals extensive repairs were made and sprinkler systems and other protective devices were installed in the state hospitals. To accomplish the second of the purposes above mentioned, Dr. Haviland was active in increasing the number of mental clinics conducted by the state hospitals, the number of social workers also was increased, and efforts were made to extend the activities of the hospital clinics to problem children. Dr. Haviland was intensively interested in bringing about the provision for the erection of the new State Psychiatric Institute and Hospital, in connection with the Medical Center, New York City, and also in the formulation of plans for the erection of a psychiatric hospital to form a part of the medical center of Syracuse University. Dr. Haviland believed that these two institutions represented the crowning achievement of his work on the commission."

DEATHS OF FELLOWS OF THE ACADEMY

ATHEL CAMPBELL BURNHAM, M.D., 176 East 80th Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1906; elected a Fellow of the Academy, January 15, 1920; died, January 19, 1930. Dr. Burnham was Physician of the tuberculosis clinic to Presbyterian Hospital and Assistant Surgeon to Polyclinic Hospital and Vanderbilt Clinic.

LAWRENCE KINSMAN McCAFFERTY, M.D., 114 East 62nd Street, New York City; graduated in medicine from Johns Hopkins Medical School, Baltimore, Maryland, in 1916; elected a Fellow of the Academy, April 6, 1922; died, January 20, 1930. Dr. McCafferty was a Fellow of the American Medical Association, a member of the County and State Medical Societies, Associate Dermatologist and Syphilologist to Polyclinic Hospital; Consulting Dermatologist to St. Joseph's Hospital, Yonkers, Manhattan Maternity and Monmouth Memorial; Dermatologist to Misericordia Hospital; Chief Clinical Dermatologist and Syphilologist to Polyclinic Hospital and Assistant Dermatologist to Vanderbilt Clinic.

FRED HENRY MOSLER, M.D., 42 East 64th Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1902; elected a Fellow of the Academy, April 3, 1919; died, January 24, 1930. Dr. Mosler was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of Alumni Association of Lenox Hill Hospital and Associate Obstetrician and Gynecologist to Sydenham Hospital.

CHARLES WOODBURY STIMSON, M.D., 22 West 32nd Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1884; elected a Fellow of the Academy, October 6, 1887; died, January 27, 1930. Dr. Stimson was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

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THE PSYCHONEUROSES AFFECTING THE GASTRO-INTESTINAL TRACT *

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The general approach to the subject of the neuroses and psychoneuroses of the gastro-intestinal tract is through the study of disordered mental processes in general as they fall in the field of the neurologist and psychopathologist, and not through that of the gastro-enterologist.

We must categorically deny that there exist neuroses of the stomach or enteric canal; we must affirm that such disorders merely choose the upper or lower alimentary tract for the symptomatic expression of a mental disturbance which differs only in kind but not in identity from psychoneuroses in general.

The older generation of specialist regarded hysterical vomiting as a disturbance of the stomach and not of the psyche; nervous diarrhea as the evidence of a disordered intestine and not essentially and totally a manifestation of a mental conflict.

* Delivered October 15, 1929.

Today, the brilliant advance made by the students of affective psychology in studying the processes of the human mind, both in its normal state and in its abnormal mechanisms, has taught us clearly the lesson that in pathological mental states one must seek the origin, the motivation and the manifestation of all the neuroses.

Whether the overt demonstration be in the cardiovascular region, in the alimentary tract, or the pulmonary or peripheral systems, the common origin of the disturbance is in the patient's psyche. As internists and specialists we must pool our interests and follow the guidance of the psychoneurologists, for theirs is the superior knowledge and theirs is the problem to the general approach of the subject.

Nevertheless practical considerations force each of us, as physicians and as specialists in various fields, to the analysis and the treatment of vast numbers of patients suffering from mental maladjustments with somatic manifestations. For the daily patient, recognizing only the end-result of the process, seeks us for relief of symptoms which to him are evidently gastric or intestinal in nature. He does not realize the nature or causation of his malady, but believes only that his stomach or his intestines are misbehaving. The recognition of the origin of his symptoms, their proper classification, and their differentiation from organic disease falls definitely in the rôle of the somatic specialist and the mass of the practitioners of medicine.

Neither the general practitioner nor I am fitted by special neurological training to handle the more complicated types of the neuroses as they frequently present themselves. To differentiate the types of hysterias and the neuroses as well as the more difficult psychoses, to classify the cases in terms of the more advanced psychopathologists as anxiety neuroses, compulsion and conversion hysterias, hypochondriasis and neurasthenias is beyond the scope of most of us.

At the very mass and numbers of cases that annually present themselves to us, force all of us to assume the

rôle of amateur psychoanalyst and students of disordered behaviour. We are forced by circumstances to diagnose, differentiate and even treat large numbers of these cases, handicapped as we are by lack of specialized psychologic knowledge. There is an urgent need that the body of the profession be capable of recognizing and roughly grouping the cases and to a large and practical degree be psychologically educated to handle at least the simpler problems dependent thereto.

ETIOLOGY

Every internist who practices gastro-enterology as a specialty soon recognizes that a large majority of the cases that present themselves are suffering from functional or neurotic disturbances. While all the specialties give ample evidence of being burdened with high percentages of neurotic patients, it would seem that particularly in the abdominal field the neuroses make up the bulk of the cases. There is no evident answer to the query of why this should be; there is only the fact that a preponderating percentage of persons suffering with mental conflicts evince predominatingly gastric or intestinal means for the outward manifestation of their woes.

This is hardly the place to enter into a detailed discussion of the causation and fundamental nature of the neuroses. The older schools of thought believe the neuroses to be founded upon heredity or upon a constitutional organic or somatic inferiority. By some a hereditary anlage, by others a constitutional predisposition or a neuropathic or psychopathic trend is invoked as a basal underlying factor. Modern thought tends to stress the environmental or developmental factors, to the neglect of the constitutional or hereditary elements. Personally, I lean heavily on the theory that heredity is the most important factor both in our physical and our mental and psychic make-up. A close observation of family groups makes it soon evident that certain behaviour and mental traits are constant factors in more than one member of a family; one frequently notes not only common physical qualities but also

common psychologic and mental characteristics identical in parents and some, if not most, of his or her children. Not infrequently one sees an almost identical type of anxiety neurosis in father and son or in mother and son or daughter, and the same neurotic predisposition may even be carried over to the third generation. Just as one notes, as Hurst has pointed out, a hypersthenic hyperacid type of stomach in many members of one family; just as one frequently sees in large families many members who complain of the same types of functional digestive disturbances; just as we not infrequently see chronic peptic ulcer invade many members of the same family—so we see an introspective neuropathic constitution in parents handed down as a dominant to various of their sons and daughters.

Heredity is a powerful factor—environment and association are also powerful but less so, being chosen and predetermined in a larger degree by the constitutional trend of character which deliberately chooses, by an inherent preference, to build up such an environment.

Another school bases the neuroses in physiological or functional disturbances of the various visceral systems of the body; metabolistic, endocrine, alimentary or nervous. This theory is still in the realm of speculation and metaphysics for it is still impossible to demonstrate the endogenous toxins or auto-intoxicants that might produce mental conflicts and lead to repressions.

Endocrine hormones may and probably do influence health and general states of well-being; but except for the sex hormones which have an undoubted effect on mental and psychic processes, a study of hormonal activity fails to convince one of their causative relations to the psychoneuroses.

The Behavioristic school of Watson would invoke the mechanism of disordered conditioned reflexes as the basis of neurotic disturbances. At first very promising, closer study fails to convince one that any elaboration of the

simple but brilliant laboratory experiments of Pawlow can be sufficiently developed into a system of psychopathic disease. To consider the psyche and mind of man as of inferior importance, to attribute human behavior to a complexity of conditioned and reconditioned reflexes and the neuroses as the result of disturbed and evil-conditioned reflexes is to magnify a kernel of truth into an exaggerated and distorted theory.

In by far the greatest number of instances Social Conflict and a dysharmony between the individual himself and his environment underlies the etiology of the neuroses. Today, as in every other time in the history of the evolution of man, there is a conflict between the individual and the conventional concepts of the group. The Social Biologic theory stresses the antagonism or lack of harmony between the ego of the man and the interests of the social group known as Society.

The instincts of self-preservation and of procreation represent the two fundamental prerequisites to and of biologic life. The threat to the former (self-preservation) constitutes the basis for the neuroses according to the Social Biologic School; according to the Freudian psychoanalysts, the causation of the neuroses lies essentially in disturbances of the sex-life.

The higher civilization of today, its greater complexity and the intensity of one's individualism lead to greater conflicts than ever between the individual's behaviour and the mass needs of the social group. The neurosis is the evidence of the instinctive desires of the individual in antagonistic relation to the purposeful moral activities of the complex social organization.

The weakening of the hold of religion, as we see it today, upon the mind and conduct of the person, has relaxed the moral conventions and has liberated the individual to a greater freedom and a more deliberate choice of personal conduct under difficult conditions. To the strongminded, this is an advantage, strengthening his self-

confidence and his will; to the weaker, robbed of the protection and the authoritative guidance of the church, this is at times almost a misfortune. Unable to turn for guidance to a supernatural deity he is forced to rely upon himself, and in his confusions and doubts his less capable mentality wavers and vacillates often engendering mental conflicts which may eventuate in a neurosis.

Simple domestic relations, even under the most favorable of conditions very often provide a nucleus of discord and dissonance upon which many of the neuroses are based. In fact, the more one sees of social and the more intimate domestic relationships, the more pessimistic one becomes of the likelihood of people living closely with other people without eventually a breach of harmonious relations. It is fashionable to make marriage the scapegoat in such discordances. True, married life with its personal intimacies and problems, its financial crises, the questions evolving and devolving over the upbringing and discipline of children constitutes, even without introducing the much overrated sex question, the most difficult and complex of human relations.

The selfishness and heedlessness of adult children are commonly, in my experience, the bases of gastric and intestinal neuroses. Conversely, the parents often originate problems of greater complexity particularly when the parents are advanced in years and the children are married and have their own problems. Irascible, demanding and autocratic abuse of parenthood creates as many problems as do the issues which arise over the training of younger and dependent children.

We are confronted daily with increasing numbers of retired middle-aged business men of ample means, who intimidated by economic conditions from re-entering the whirlpool of business stress, are forced to convert an active life into one of necessitated inactivity. Most of these men know how to work but not how to play; they are completely devoid of the spirit of relaxation and recreation. Such forced idleness is ruinous to the morale of

many of the more capable men of affairs and often gives rise to conflicts developing into well recognized neuroses, some of them with very well defined gastric and intestinal manifestations.

The same refers to the increasing numbers of small business men forced out of their employment by the rapidly changing economic conditions incident to the organization of chain groups and large financial coalitions and consolidations. This is a problem which will probably in the near future assume a more serious aspect.

Fatigue, mental and physical, often furnishes a groundwork for the development of exhaustion states and of gastric and intestinal neuroses. It is surprising to note how often many of the gastro-intestinal functional conditions and many of the somatic neuroses disappear with sufficient sleep, rest and play; problems which seem insurmountable, outlooks bordering on depression and pessimism, often disappear or yield to deliberation after sleep and rest. While this fact may be regarded as trite, pure fatigue of the body and mind from strain and insufficient hours of sleep may often be overlooked in connection with the etiology of the neuroses. Insomnia itself is a very potent factor for evil and may lead to exhaustion and its neurotic consequences.

Alcoholism, or in its milder aspects drinking for sociability sake, is hardly a factor in the origination of the neuroses and is in fact responsible for only a very exceptional functional gastric disturbance. In spite of the spread of the drinking habit since prohibition to nearly all classes of society, alcoholism is less a factor in mental disturbances and the causation of neurotic degenerative states than before. On the other hand tobacco is becoming a more serious problem, and the rapidly extending use or abuse of cheaper cigarettes by all classes of society is introducing new problems. It would seem that many highly excitable and nervous states are founded upon excessive cigarette consumption; heartburn, hyperacidity, nervous constipation, insomnia and very probably duo-

denal and gastric ulcer stand in a causal relationship to the current abuse of smoking. It would seem more logical, as experience increases, to attribute to the excessive use of tobacco certain types of obstinate and persistent heart-burn occurring after meals and associated with epigastric pain and a spastic type of constipation. The symptoms may become so severe as to simulate gastric or duodenal ulcer. The effect of the withdrawal of the tobacco, particularly cigarettes, is striking and usually results in an abrupt disappearance of symptoms. There seems also to be some scientific basis for the conclusion that excessive smoking can lead to a recurrence of ulcer symptoms in susceptible persons.

The Psychoanalytic Theory of the Neuroses is a purely psychological explanation of their origination. This very important school of psychologists, founded about forty years ago by Breuer and by Freud, represents a most noteworthy advance in our consideration of this subject. Denounced by the more conservative because of its over-emphasis on the importance which the sex life plays in mental hygiene, it yet represents a most lucid and thoughtful and serious attempt to analyze the difficult situations arising in neurotic and psychoneurotic behaviour. Apart from its great contribution in the rediscovery of the importance of sex and in the emphasis placed upon the sex motif as a motivating factor in many of the complex situations in life, psychoanalysis has emphasized the importance of unconscious mental activity; frequent conflicts between subconscious fixations and the will-to-do lead to conditions of mental turmoil, states of anxiety and eventually well established somatic neuroses, psychoneuroses and particularly the hysterias.

Failure to adjust to difficult situations constitutes the external conflict or the mental trauma. Repression leads to regression to infantile levels of sex-life and the origination of an inner conflict. Further repression of ungratified wishes and the suppression of the libido, may lead, by sublimation, to the formation of symptoms very often of

gastric or intestinal nature. Hysteria represents a further regression to an earlier narcissistic state with the possible origination of a compulsive neurosis or a conversion hysteria.

Psychoanalysis constitutes a real advance; whether one accepts it in totality or questions the extent to which it carries its suggestion, this school of thought deserves the most careful consideration and will be generally condemned only by those who cannot or will not take the trouble to comprehend it.

Finally one must consider the line of thought advanced by Adler of Vienna. He bases the origin of the neuroses in a visceral or somatic inferiority and the attempt of the patient to overcompensate the conscious physical and mental inferiority by the assumption of a "masculine protest." Here the idealization of the parent is made a basic thought and the subconscious effort to imitate or improve upon the parent ideal constitutes a basis for the neuroses. My experience with this system of psychological analysis is necessarily limited and not particularly convincing.

SYMPTOMATOLOGY

Generally speaking the behaviour of the neurotic individual is quite characteristic. He is usually small, light in weight, emotional and temperamental and belongs most often in the asthenic group of Stiller, rather than in the apoplectic or hypersthenic constitutional category. The neurotic springs from the same grouping of ptotic individuals from which genius and persons of powerful achievements also frequently originate. His temperament and emotional reactions are usually superficially observable; he enters the consultation room with a page full of written reminders and queries lest he overlook some fact of vital importance to his health. He talks freely and egocentrically of his symptoms, repeats himself innumerable times, dwells insistently on details and in his volubility omits the salient points of his history.

He is essentially anxious, oppressed with fears and doubts—in fact anxiety and indecision are his main evident characteristics. He is unable to make a decision or incapable of sticking to one. He is sensitive, apprehensive and though selfish, lacking in self-confidence. He is often closely attached to his family who in his anxiety seems to offer the nearest prop and yet finds most of his ailments to originate from family and personal differences and problems.

He is intensely preoccupied, overenthusiastic at times, easily depressed at other times, rarely consistent. He is sick today, much better tomorrow, and incurably ill next week.

Rather than recite the list of gastro-intestinal symptoms that characterize this class of neuroses and psychoneuroses let me illustrate by short reviews of case histories the outstanding clinical complaints. At the same time we may make the effort to attempt to classify such cases, accepting always the classifications of psychoneurologists as at present codified by the School of Psychoanalysts.

Case number 1 refers to a lawyer 36 years of age who in the last few weeks complained of dizziness, depression, constipation, itching in the anal region and excessive tiredness. He has an uncomfortable feeling in the abdomen, poor appetite and complains of fullness and distress after eating. He has had a long course of colon irrigations without relief of symptoms.

Upon analysis two points have important bearings. One, he underwent an operation for so-called "chronic appendicitis" two years ago. The clean-cut abdominal scar of an appendectomy for this phantom disease is a stigma which marks a very large percentage of neurotics with abdominal pain as an outstanding complaint. The numbers of young and nervous individuals who carry such scars of unnecessary operations are a token of inaccurate and careless medical diagnosis and of meddling surgery. The post-operative course in this unfortunate individual had been

further complicated by a pulmonary embolism and by a phlebitis of the left saphenous vein, causing a threat to life, a protracted convalescence and a loss of seven months of efficient working time; and the abdominal symptoms had not been relieved by the operation.

Dizziness is another of the prominent symptoms of this and like patients. Vertigo is a common manifestation of the neuroses. Actual labyrinthine disease ("Menière's Syndrome") with violent vertigo is comparatively very rare. Dizziness due to that vague concept "intestinal intoxication" is more frequently seen and is noted for its rapid subsidence under colon irrigation therapy. But dizziness as a symptom of the neuroses, pure and simple, is a common phenomenon amenable to rest and sedatives.

The third point in this case was the elicitation of the fact that a near member of the family had recently died of carcinoma of the rectum. The etiology of the neurosis was thus evident. Founded in a man of temperamental instability, subject to vague neurotic abdominal complaints, a carcinophobia was built up with the sublimation of the unconscious fear upon the intestine and rectum. This was an evident case of anxiety neurosis.

Case number 2 was the father of the former patient just discussed. This sixty years old man suffered from burning pains all over his abdomen, a bitter and nauseous taste in his mouth, frequent headaches, a feeling of lifelessness in the forenoon. He was easily depressed, suffered from insomnia and cried at slight provocation.

The analysis in this case shows a strange condition of familial and domestic discord. The old man is separated from his wife by the act of his children: The children, all now adults, dominate the picture; the father regarded and treated by his family as senescent is condemned to live alone. An anxiety neurosis, bordering upon a hypochondriasis was thus engendered.

Case number 3 relates to a seventy-years-old man whose sole complaint was "constipation." Peculiarly, this un-

fortunate was never constipated, regular daily movements being easily initiated by a roughage diet or mineral oil. But he presents the picture of one who complains continually of insufficient movements, of a feeling of rectal fullness and bloating. He denies the fact of defecations, prevaricates weakly, incessantly phones and makes a nuisance of himself! He spends his days and his means seeking medical aid from various classes of specialists for a phantom constipation. His is a self-evident case of hypochondriasis with an undoubted ano-erotic hysterical element.

Case number 4 is that of a middle-aged woman whose outstanding complaint for many years has been abdominal pain. The pain, unlike that of organic visceral disease is unrelated to any system of organs; it varies from week to week, now gastric, now intestinal, now renal in location. She has been thrice operated upon, once for chronic appendicitis, once for "gall-bladder" disease, and finally for retroverted uterus, all three evidences of misguided medical advice. An analysis of the social and personal factors in this case leads to no satisfactory end, as is unfortunately so common an experience with complicated emotional conflicts. There is a conjugal lack of companionability without a loss of sex love; there is a competitive jealousy of the husband's family and numerous other factors of lesser importance. The School of Adler would analyze this case and base the neurosis upon a visceral and mental inferiority-complex and an attempt at building up a "masculine protest." This was evidenced on the part of the patient by excessive imitation of masculine sports, futile attempts to acquire a productive career and other imitative masculine faculties. The psychoanalysts would see in this person an instance of sex repression with conflict and a loss of interest in the conjugal state. The case would seem to resemble an anxiety hysteria in a person of psychopathic traits, with a sublimation of the conflict in symptoms of abdominal pain.

Conversion hysteria is not so infrequently met with in general and special practice. The case (case number 5)

of a woman entering a stormy artificial menopause at the age of 44 years, suffering from morning vomiting, insomnia, excessive nervousness and depression and a dislike and intolerance to foods. In addition, the case was characterized by spells of nervous diarrhea, this symptom being intensified by all states of emotional upset and domestic strife. In this instance there are combined many of the recognized causes for the development of the neuroses. There is a conflict resulting from a loss of sex-interest, solicitude and consideration on the part of the husband; the feeling of a conscious inferiority due to the waning youth, lessened sex attractiveness, increasing corpulence and maturity; and there is also present the endocrine disturbances and hormonal imbalances that accompany menopause, intensified as it was by intensive ovarian radiotherapy.

The morning vomiting is again a sublimation of a neurosis based upon a social, domestic, sexual and endocrine disturbance.

Hysterical vomiting as a sole symptom of a neurosis is very common. It is seen frequently in young girls who have a fear of pregnancy; in men who are overworked and under extreme tension; in retired men of affairs who are in conflict with their newly found and forced leisure and in numerous other instances illustrating conversion hysterias. It is often associated with nervous loss of appetite "anorexia nervosa" and often constitutes, "like bulimia," excessive appetite, a symptom of well-organized psychoneurosis in the form of conversion or compulsion hysterias or actual psychopathic states. In a milder form, I observed compulsive vomiting in a minister, the head of an exceptionally intelligent congregation, who forced to preach on Sunday morning, was so obsessed with his own inferior education as a self-made and self-educated man, that his sermons were threatened and often interrupted by an overwhelming nausea terminating in vomiting. And so the examples might be multiplied many fold.

Though this paper is intended essentially as a review

of the neuroses as they evidence themselves in alimentary manifestations, a true analysis of the situation demands a discussion of functional gastric and intestinal disturbances, either in association with psychoneuroses or as manifestations of dysfunction of the autonomic nervous system. Deviations from the normal secretory or motor activity of the gastro-enteric tract constitute the functional disturbances. Among these may be mentioned abnormal states of secretory activity in the stomach, namely, hyperacidity or hypersecretion, or achlorhydria or achylia gastrica; motor disturbances such as hyperperistalsis or on the other hand true gastric atony. In the intestinal tract we recognize such functional abnormalities as mucous colitis and that large group which we familiarly speak of as constipation, spastic or atonic in variety. Abnormal emotional and psychic states stand in relation to such functional visceral disturbances as cause to effect. A hidden mental conflict may result in one instance in an anxiety neurosis; in another in a conversion hysterical loss of function; but when long maintained it may very well give rise to just such a functional disturbance as previously enumerated.

The effect of the emotions upon the functional activity of the alimentary tract is easily demonstrable; medical literature, beginning with the classic experiments of Beaumont upon Alexis St. Martin and continuing through the observations of Cannon, Carlson, Pawlow, Babkin, Alvarez and many others, as well as personal experience are redolent with such convincing examples. Beaumont noted definite motor and secretory inhibitions to follow the emotions of anger or disappointment; Pawlow created the concept of psychic gastric secretion as the initial stage of digestion in the stomach. Cannon suggested the existence of a psychic increase of gastric muscular tonus upon the sight and taste of food. It is well known that the fear of the passage of a stomach tube may inhibit gastric secretion in an intimidated patient. Anger very frequently causes the immediate sensation of heartburn, and fright may cause an increase of intestinal motility eventuating

in diarrhea or may cause a fixed spastic constipation. Lueders reported variable degrees of achlorhydria as regularly present in many of the psychoses particularly melancholia. Bennett and Venables in the case of a hysterical girl in a state of hypnosis were able to vary the gastric secretion by suggesting either agreeable comestibles or reviving pleasant associations or by suggesting hypnotic thoughts of fear or anger. Achylia gastrica simplex is a condition of complete absence of gastric secretion both for acid and for ferments and is, as we now understand it, usually a congenital and permanent condition which occurs in some few persons of high temperamental and emotional constitution. Achylia gastrica often is associated with or results in a so-called gastrogenous diarrhea. We may observe with interest that the achylia which accompanies pernicious anemia rarely gives rise to diarrhea but nearly always to constipation. The very frequent and constant intestinal overactivity which accompanies achylia gastrica simplex is probably just a continuation of and another manifestation of the original emotional and psychic state rather than an effect of the gastric anacidity as such.

The means by which such psychic traumata give rise to functional disturbances is by way of the autonomic or vegetative nervous system. The alimentary tract is entirely under the control of the two subdivisions of that system, namely the parasympathetic in antagonistic relation to the sympathetic nervous system. The vagus and sacral nerves constitute the part by which psychic and emotional states are transmitted in a stimulatory way to the alimentary tract, causing increased gastric secretory abnormalities, sphincter spasms and increased intestinal hypermotility. The sympathetic system carrying the analagous inhibitory fibres, when overexcited by psychic affective states or through the medium of endocrine stimulation (particularly the adrenal medulla), gives rise to hyposecretion, motor atony and states of muscular stasis. At times it would seem that the autonomic nervous system itself is independently capable of originating functional

disturbances. Cardiospasm is such an instance, and Hirschsprung's disease of the colon is another. Both conditions result from an imbalance or achalasia of stimulatory and inhibitory stimuli to the nodal stations controlling respectively the sphincter of the cardia and the rectosigmoid segment, and are not in my opinion associated with psychic abnormal states. But these seem to constitute exceptions rather than the rule. Most of the conditions latterly attributed to idiopathic disturbances of the autonomic nervous system, as if that system itself were capable of initiating disease, had far more logically be attributed to foci of psychogenic and emotional conflict and will thus fall within the group of the visceral or somatic neuroses. By that same token, that intractable and therapeutically baffling condition which we misname "mucous colitis," a neurogenic disturbance characterized by alternating states of persistent diarrhea with the discharge of abundant amounts of intestinal mucus, and obstinate constipation, is not in any sense of the word a colitis, but is essentially a neurogenic or better a psychogenic constitutional condition with predominating intestinal manifestations and dysfunction.

DIFFERENTIAL DIAGNOSIS

We thus note that the preponderating gastro-intestinal symptoms of the neuroses are pain of an unclassified variety, disturbances of motor function such as vomiting, diarrhea or constipation; disturbances of appetite such as anorexia, abnormally great hunger, or the appetite for unusual foods or substances. Functional alimentary disturbances often accompany the neuroses, these including gastric hypersecretion and hyperacidity or on the other hand achylia gastrica, air-swallowing (aerophagia), belching, nervous diarrhea, etc.

These symptoms being likewise common manifestations of many organic diseases, how shall they be classified and differentiated, the neurotic and psychic from the truly pathological? For this must represent our first and most

important critical differentiation. It is well to consider every case that presents itself as being possibly of organic origin, no matter how evident and superficially convincing the neurotic element may be. For the neurosis often hides or is accompanied by a focus of inflammatory or neoplastic disease. We must bear in mind three possibilities: one, the existence of a pure neurosis with functional disturbances; two, the case may be of truly pathological origin arising in a diseased viscus; three, an evident psychoneurosis may mask a visceral disease, both organic and functional conditions existing. The clinician must approach the analysis of his case with an absolutely open mind, heedful of all possibilities. A preconceived conclusion, a rapid guess, incompleteness of examination, or a prejudice against unfortunate neurotics is fraught with danger to the patient as well as to the reputation of the physician for conscientiousness and carefulness as a diagnostician. More crimes are committed in medicine from carelessness than from ignorance and inexperience and even in experienced hands "snap diagnoses" and reliance upon clinical impressions are fraught with danger.

A careful history is all-important; a painstaking physical examination is a pre-requisite even though it be essentially negative; and a careful roentgenographic study is today absolutely essential. It is hazardous to forego x-ray examinations, for one is frequently surprised to discover a peptic ulcer, a diseased gall bladder or a new growth where least intimated by the symptomatology. This refers particularly to persons who are insensitive to pain, for such people, being deprived of this important defensive mechanism, may easily gloss over mild or faint subjective apperceptions and fail thus to give proper account of important symptoms. The neuroses with predominant abdominal complaints must be differentiated carefully from gastro-duodenal ulcer, from gall bladder disease or recurrent appendicitis, and above all from carcinoma of the alimentary tract. Today, probably more than ever, the onset of coronary artery disease (angina pectoris) with initial abdominal symptoms, in any patient

past twenty-eight years of age, must be fully guarded against and recognized.

Regarding the symptom of pain, the fact is generally overlooked that not every person reacts to the same painful stimulus to a like degree or in a like manner. Given a harmful irritant of constant intensity, the reactions of various individuals may be classified on a scale running the gamut from marked hypersensitiveness to the other extreme of almost complete insensibility. In a general way certain physical and psychic factors operate to modify the reception of pain. Among the physical factors are age (younger persons being more, older persons less sensitive to pain); sex (females more sensitive than males); previous condition of bodily fatigue, the summation of former repeated hurts, and other recognized physical factors. Among the psychic factors are highly irritable mentality or emotionalism, vagotonic predisposition, a true psychoneurotic constitution, or conversely, a phlegmatic, indolent or equable personality. These together characterize a constitutional ensemble which is probably congenital in all of us, and one which modifies in a great way the degree and manner to which one reacts to a painful stimulus.

Pain may be defined as the mental interpretation of some abnormal or generally harmful process originating in the organism. Such stimuli may be either physical or psychic in origin. Hurtful irritants arising in the viscera are carried in the afferent sympathetic fibres into and through the posterior spinal ganglia; whence decussating and traveling by way of the lateral spinal columns they reach the optic thalami, that large central group of cells which receives, as a center, all peripheral reflective stimuli. The physical, or equally the neurogenic hurt is from the optic thalami "stepped up" into the cerebral areas of the postgyral sulcus whence it enters consciousness as mental or psychic pain.

The variability of the receptivity of pain depends therefore on two factors: (1) the state of tenseness and re-

activity of the lower brain and hypothalamic centers; and (2) the mental and psychic constitution which congenitally characterizes each individual and interprets or translates the stimulus into the consciousness of a pain.

What is a severe abdominal painful cramp to a hypersensitive person may be described by a normally sensitive patient as a mild or dull sensation; and by a person comparatively insensitive may be completely overlooked or result only in a complaint of scant uneasiness or distress. Thus a clinical history which constitutes a recital of diverse and continuous severe bouts of pain may be variably interpreted. If the person is found to belong in the class of those physically hypersensitive, and is in addition psychoneurotic or emotional it may be presumed that both the physical pain and the mental expression of that pain are exaggerated over the normal standard of sensitivity; in such a case the symptoms should be markedly discounted. But, on the other hand, the same symptoms in an insensitive phlegmatic person call for the full acceptance of every expression of pain, even to an even greater appreciation of the significance of the phenomena.

The greatest caution must be exercised in avoiding the mistake of thinking that the degree of psychic sensitivity parallels the physical sensibleness to pain. We have repeatedly found that an emotional or psychoneurotic person may be quite insensitive to physical pain as judged by the styloid pressure sign; and conversely many a phlegmatic, equable personality is unexpectedly found to be normally or even exaggeratedly pain-sensible. It is not sufficient to say that a patient is neurotic and therefore hypersensitive and to judge his symptoms as of purely functional or psychic origin. One must in addition test for physical pain, for therein lies a greater significance in the interpretation of the clinical complaints of pain than exists in the facies, manner and psychic constitution of the individual. If the knee jerks, Achilles tendon reflex and clonus are used as rough guides to the nervous irritability of a patient it will often be found that persons ~~are~~

markedly exaggerated reflexes and pseudoclonus are yet insensitive to pain, and vice versa. In evaluating the painful phenomena engendered by the abdominal viscera it is the physical sensitiveness to pain as judged by an algometric method and not the mental expression of the pain, that is the important differentiating guide.

In gastric neuroses, or more properly speaking, the psychoneuroses with abdominal manifestations, one must be particularly careful to evaluate the complaint of pain from both the physical and psychic standpoint. Physicians since Hippocrates have recognized the facility with which neurotic individuals both create imaginary pains and exaggerate mild sensitive phenomena into gross complaints. But particularly here enters the importance of differentiating psychic from physical pain, functional from organic conditions. Great caution is required in the acceptance of the complaint on its face value of a person who is both physically emotional and also pain-hypersensitive. This emotional make-up may well cause him to express subjective functional phenomena in terms that masquerade exactly as those of organic origin. If the same type of individual is, however, found to be insensitive to physical pain, it behooves one to place full credence in his description of his subjective symptoms and to look carefully for a focus of organic disease as the point of origin of the complaints. I can well recall a man who because of his self-evident neurotic labile temperament had been passed over for twenty years as a neurotic whose pains were psychic and functional in origin. However, on testing him, it was found that he was markedly subsensitive to physical pain; a revised viewpoint was therefore taken of his clinical history, and careful studies now revealed a duodenal ulcer, confirmed at operation.

PROGNOSIS AND TREATMENT

In general the outlook for the neurotic is poor; occasionally the physician can by his authority dispel fear and reawaken self-confidence and so by suggestion bring a case

to a happy outcome. But as a generalization, the vast number of neurotic patients who, ceaselessly and obstinately hopeful, make the endless round of physicians with reputations, attest the failure of our profession successfully to cope with their problems.

Our difficulties are many, some of the failures being due to us, physicians, as a class, some attributable to the Gordian knots we are asked to untie. Most of our difficulties are due to the lack of time we are able to devote to the individual case and to the lack of specialized psychological and neurological knowledge at the disposal of the practitioner of general medicine. To do justice to a complicated neurosis, to analyze the individual situation, unearth the unconscious conflicts and by catharsis bring them to the surface, is a laborious and delicate task requiring very much more time than the internist can ordinarily devote and the patient is willing to underwrite. Most often we are little less successful than the patient in unraveling the social snarl in which he finds himself enmeshed. Social biological problems are never simple; they involve not only the patient but the numerous adjacent individuals of the family unit, and business and economic conditions both personal and sociological. We can often control the patient, build up his mental reserves and strengthen his ego, but can we ever or even sometimes change the problem as it affects the other actors in the drama? Who is the Solomon who will judge the right from the wrong in personal and domestic strifes, particularly when only the plaintiff is being heard and then only with a self-prejudiced leaning? But even presuming upon a decision and a line of advice and conduct for a patient, can the physician engender love where there is none, attention and solicitude from a wandering mate, eliminate jealousy by an authoritative flourish or bring prosperity and restored business acumen by an ex-cathedra command? The patient himself is often unconsciously unwilling or unable to change himself thus offering one of the greatest difficulties in the whole situation.

In the simple cases, particularly the anxiety neuroses, the sympathetic understanding physician is of the greatest help in restoring the patient's confidence in himself, and in reassuring the anxious one that organic disease is absent. In the complicated cases the assistance of trained neuro-psychologists is necessary. With a very limited experience it does not seem that the school of Adler can do more than point out a supposed inferiority complex and its resultant masculine protest; it is questionable that such an analysis, no matter how interesting, will lead to cure. Watson's theory of behaviour and disturbed or malicious conditioned reflexes is still little more than a laboratory hypothesis and is far from a perfected system of psychological therapy.

For the more complicated cases, particularly the hysterics, the psychoanalytic method of Freud and his followers offers the most rational and most promising school of therapy. This method too has its obvious drawbacks. It is very time-consuming, in complicated cases requiring six months to two years for a successful analysis; it is therefore expensive, usually beyond the means of all but the most fortunate. It is impracticable in hospital and ward work, both because of the lack of privacy and facilities and of time on the part of the neurologist to handle the vast mass of the material. It lays undue stress on the sexual element in personal life, rarely failing to find some sexual dysharmony in every patient's problem and often unable to look beyond such a limited viewpoint to the adjacent broader biological and sociological problems. But in due justice to psychoanalysis we must say that they have offered us the most logical and most scientific approach to the solution of the question of dealing with psychoneurotic persons.

As a practical problem, however, because of the mass of the material and the limited number of accessible specially trained neurologists, it becomes necessary for each and every one of us to become his own analyst.

Success in the handling of emotional and neurotic individuals is based upon certain characteristics, some of them natural gifts and some of them acquired by effort and experience.

- (1) A natural psychoanalytical insight.
- (2) A sympathetic bearing arousing confidence.
- (3) A broad experience with world affairs.
- (4) Dignity and the manner of authority.
- (5) A broad general education founded upon a breadth of view and a catholicity of interest in men and affairs.

A suggestion arising from such a one is likely to carry weight and help bring order out of a mass of disorder and conflicts. Suggestion in the form of a reassurance, a sentence of advice, or an authoritative request to rearrange methods of living will do what less obvious means cannot accomplish. Change of scene, hydrotherapy, sunlight and drugs all have their usefulness, but the real therapeutic agent is suggestion and advice.

The failure of the profession properly to educate itself in this problem and successfully to cope with it has led to the rise of cults and quackery throughout our civilized world. Old as time and medical history, the holy medicine man and the quack impostor of the cultists of today, have taken advantage of the situation and have exploited themselves and their faiths as magical, spiritual or religious healers. Whether by one method or another they practice by means of suggestion and suggestion only; whether by teeth of serpents, magic fire, Perkins tractors or Mary Baker Eddy's Monitor their methods are all based upon suggestion. Were that all, there would be less criticism—but it is their inability to make a scientific differential diagnosis of diseased conditions that makes a danger to the body social. They are successful only in proportion as they are led by men or women of unusual ability in understanding human nature and human equations.

The reflection is upon the profession of medicine. The trained physician should be the healer, not the inexperienced but loquacious seller of patented ideas. We have need not so much for more neurologists, though that would be a benefaction, but for an improved effort on the part of the profession in this direction. The doctor of tomorrow must have a broader and more general fundamental education, he should be widely traveled; the choice of the best human minds and material should go into the making of a physician. He should develop his interest in the Arts, in Literature and in the Drama, both in life and on the stage.

Literature particularly offers the widest acquaintance with mankind; for, with the rapid development of psychological fiction and drama, a better opportunity than ever is offered for the acquisition of knowledge concerning human behaviour, social conduct and the problems of the individual and of life. No man can live all of life in its various ramifications in the span of seventy years; Havlock Ellis did not live the sex life he wrote about. Read Flaubert, Balzac's *Comedie Humaine*, Stendahl, Ibsen, Thomas Hardy, Wassermann, Knut Hansen and above all Dostoyevsky and the master of all psychological fiction, Marcel Proust, and learn life, psychology and the ways of social conflict. Thus will we be in an improved position to handle with sane judgment and human understanding that largest number of invalided persons who constitute the class of "nervous patients."

POSTOPERATIVE EMOTIONAL DISORDERS: THEIR PREVENTION AND MANAGEMENT*

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It might be truthfully said that there is practically no such diagnosis admissible as Postoperative Psychosis or Postoperative Neurosis. It might, on the other hand, be equally truthfully stated that any kind of emotional or mental disorder might apparently be caused by an operation.

Usually an operation is only an incident in the chain of circumstances leading to an emotional disorder, though it may be a rather important one.

We are gradually getting away from the idea that mental and emotional disorders can be classified as clear-cut clinical entities as, for example, pulmonary tuberculosis or cirrhosis of the liver are classified. We do not clarify them when they are crowded into a classification, and it is not helpful in our view of them therapeutically.

It seems to be wise, in view of the present state of our knowledge, to look upon emotional disorders as a breaking down of the adaptive ability of the organism due to a variety of factors and then to consider the relative importance of these various factors from the etiological and therapeutic standpoints, and not to be too dogmatic about classification. The adaptive ability of the patient breaks down at times of special stress. For example, physical, emotional, economic.

Adolescence is an extremely important period when many break down physically or emotionally. We all go through a period of turmoil and indecision at this time and some never recover fully from the damage done.

* Delivered October 15, 1929.

Childbirth and the puerperium for the woman are extremely important and many are the psychoses and neuroses which are started or brought to light in this period. Here we can see clearly that psychological and physical factors are both present. A serious operation may likewise be an important event in an individual's physical and psychic life and its effects both for good and for ill hard to measure. We must not, however, consider it as the only factor and just because an individual has developed mental or emotional symptoms after an operation, we must not consider that the operation is the only factor. It may possibly be of no importance; it may be the precipitating factor, or it may be of the utmost importance. Why should we not consider the problem as an equation?

The individual plus a special situation leads to a reaction—in the present instance, a maladaptation, which we are pleased to call a neurosis or psychosis. (We are considering at the present time situations which include an operation).

Now, ideally, we should consider carefully *first* the individual; later, the situation. We should inquire—What is his stock? *How* have his forebears and immediate family reacted to difficulties in their lives? In other words, what has been the pattern of their maladaptation? (Both emotional and physical difficulties should be considered). What is the patient's physical type? What is his previous physical history? What is his general intellectual level? What are his previous experiences? Has he ever been in a hospital before? Has he ever been operated on before? What is his station in life? What are his capacities for reacting to novel situations?

What are his instinctive reactions? For example, is he fearful? Is he friendly? Is he strongly attached to his family? Is he subject to mood swings? Is he persistent? Is he vindictive? Is he stable? Is he impulsive?

In the case of a patient not acutely ill, or when it is proposed to operate for a chronic disorder, or to explore, it is, I feel very strongly, the duty of the attending physi-

cian to make careful inquiry and form an honest estimation of the patient's probable adaptability before the operation; and also to ask himself the question—What will the effect be on this patient if the condition is not relieved very materially, or what the effect if nothing is found on exploration? He may also need to ask this of the patient or his relatives. The physician may then, of course, in all sincerity feel that he should go ahead and operate or advise operation. I cannot but feel that if this preliminary survey is honestly and accurately made, that there will be a smaller total number of bad psychic risks operated on, it will prevent grave criticism and, I believe, it will prevent the formation of many postoperative neurotics and psychotics.

As an example of a failure to do this, I might cite the following case: A woman of about 30 went to a plastic surgeon and asked him to operate on her nose to make it more beautiful, though it was not bad to start with, only a trifle long. He did so, without much of any history. She was not satisfied, wanted it changed back, went about with a veil and refused to see her friends. Visited many physicians demanding to have her old features back again. Threatened to kill herself and to humiliate the surgeon by having him written up in some periodical.

A rather cursory history revealed the following factors which, if known, might have prevented this operation and the resultant condition:

Mother—unstable.

Sister—a suicide and probably had a chronic psychosis.

Patient's father died when patient was 6 or 7 years of age and she was brought up by stepfather, a man very jealous, exacting and dependent on the patient emotionally. Patient reared without adequate sex knowledge. She was frigid sexually. For pecuniary gain probably, she entered into a common law relationship with a man and lived with him for ten years. Just a little before her visit to the surgeon he had thrown her over and it is fair

to assume that the wish for an operation was an effort, though an inadequate one, to change her features so that she might get herself into his good graces again.

This patient is obviously unstable emotionally, impulsive and unreliable and gives a history of such a condition going back many years. It was, of course, not advisable to *re-operate*. One would have met with the same difficulties again.

She was relieved by increasing her social contacts and encouraging her in respect to her nose, which was actually a good piece of work though rather unnecessary.

One might cite numerous similar instances of other sorts of operations—of abdominal operations especially, which have been unwisely done or done without an adequate preliminary survey.

It sometimes happens that after a survey of the patient's history wherein are found definite psychical maladaptations that these are adjusted or considered carefully and that operative procedure is advised. This is not, I think, proof that there is a contra-indication to taking a careful history and considering emotional forces. Indeed I believe it fortifies the patient. They do not thereafter expect to be made over completely by an operation and are not told that they will be absolutely cured; but certain symptoms are evaluated and patients can then be assured with reasonable certainty that these will be helped, and that other symptoms need different treatment.

The evaluation of the symptoms is enormously time-consuming but not more so than operating three or four times and distinctly less mutilating. A case illustrating this is as follows:

A young woman of a rather hysterical and, to use a lay term, temperamental personality, married to a very poorly adjusted man, complained of attacks of epigastric pain which seemed to be closely related to attacks of anger and resentment. She had been operated on several years

before this and a relatively normal appendix removed. She was not married at that time but was unhappy in her work.

She was temporarily relieved by isolation, rest in bed and having the personal, family and marital conditions gone into thoroughly. The hysterical element was then explained to her, it being considered only as a part and not as the whole picture because we knew that there was a *duodenal* deformity with spasm, though not one of great severity.

Patient left improved but was followed and it was later demonstrated more conclusively that pain was also related to lifting and bending. On having another definite attack it was decided to operate, careful gastro-intestinal studies having been made. She was operated, had a good convalescence and has been relieved of pain for a longer period than ever before. It was a difficult task for this patient to consider these two elements, the emotional and the structural as both entering into the picture because she had been considered before as either solely hysterical or as having severe organic disease and not as having a little of both.

Cases are sometimes even now seen where an operation has been done on a frankly psychotic patient to relieve a symptom which on a little questioning would have been shown to be delusional. For instance, an old lady was curetted because she thought she was pregnant. This is almost always worse than useless. I am not unaware that surgeons are deliberately deceived by relatives sometimes in this respect. Of course, in a situation like this the psychotic symptoms are likely to come out with added intensity following the operation, but it would obviously be incorrect to call this a postoperative disorder, though the operation played perhaps a very small part. Adequate histories taken by the physician himself, not by an office nurse or so-called historian, would prevent many of these operations. History taking is an art and should not be delegated entirely.

trouble was, he wept copiously and loudly. He cleared up early in the morning.

The next night he was excited and prayed, sobbed and yelled. He cleared again in the morning. He spoke about his periods of confusion but could not explain them.

When I saw him, January 6th, he was reacting to hallucinations apparently visual and possibly tactile. He called the impressions radio-active, he picked at the bed-clothes and gestured at objects. He was elated and at times euphoric. Speech was slow and drawling. His religious, mystical, exalted mood was easily dissipated, by sharp and direct questions which he answered correctly. His orientation was correct.

By January 11th, or about three weeks after his operation, he was clear all day and shortly after this he was not a problem psychiatrically.

To consider the treatment of such a disorder as the foregoing, there are a few general principles but many individual ones.

The alleviation of the toxic condition is of primary importance and must be continued at all costs. Operation, transfusion, infusion, fluid forcing, nourishment forcing must not be withheld because of the patient's mental state but rather increased care should be taken that these medical, surgical and nursing procedures be carried out.

A nurse or nurses who are not afraid of the patient because of his bizarre productions and behavior, and who have had training, or experience, so that her treatment of the situation is considerably more than vaguely and desperately attempting to restrain and quiet the patient, is really essential—for as much freedom as is consistent with safety should be allowed the patient. Usually this has the effect of quieting, whereas constant restraint has the effect of increasing fear and causing struggling. Nurses who have had training in the better psychiatric clinics have a much more tolerant and versatile attitude

than the average general nurse. Nurses should not be changed frequently as new ones start with prejudice and are at a disadvantage from the start.

The use of sedatives is helpful but they should be given artfully and not routinely, and one should remember that they are increasing the toxic state to some extent. Probably it is advisable to change about a bit and to use by preference those sedatives which are rather easily eliminated first. Opium, or its derivatives, is quite useful. Bromides should be used with caution and not too long at a time. Barbital derivatives are useful but sometimes produce toxic effects.

The question of transfer to a psychopathic hospital or sanitarium is often brought up and in attempting to answer this, one should really consider or get advice as to whether the patient will get better treatment there than in the hospital or home; also is it likely to be a short or a long case.

Many psychopathic hospitals are not very well equipped to care for physical problems and the public ones are often so overcrowded as to render it unwise and even dangerous to transfer patients to them, especially patients who are very ill physically. I know that some acutely disturbed delirious patients have been so shaken up and upset by the transfer that they have died shortly after admission to a psychopathic hospital. This should, I think, rarely occur if intelligent precautions are observed.

Of course patients who cannot possibly be cared for in a general hospital should be transferred, but my plea is that a real attempt be made to treat them before this is done and that a little delay be made as these toxic cases are often quickly-recovering.

SUMMARY

Operations are rarely, if ever, the sole cause of a neurosis or psychosis.

The careful study of the individual's adaptive abilities will prevent many unnecessary operations and will yield information leading to the correction of difficulties, which will render individuals less likely to show symptoms of emotional disturbance following operation (Postoperative neurosis).

The very confident assurance to the patient or relative that an operation will absolutely cure an obscure disorder, colored by a psychical maladjustment, is often pernicious and should only be done after a very careful evaluation of the data. However, it is permissible often to tell patients or relatives that an operation will help certain symptoms.

Psychoses are due to operations rarely, except with exhaustive or shock features, infection, other systemic physical disease or other mental disease which is latent.

The toxic exhaustive type of psychosis due to operation, or occurring after operation, needs very careful handling both from the physical and the mental sides and this is often better done in a general hospital provided there is trained and sufficient personnel.

A REPRODUCTION OF HIRSCH AND PAGEL

Biographisches Lexikon der hervorragenden Aerzte aller Zeiten und Völker. 2. Auflage, herausgegeben und bearbeitet von Franz Hubötter. I. Band. Aaskow-Chavasse. XXXVIII, 898 pp., 19 pl., roy. 8°, Berlin & Wien, Urban & Schwarzenberg. 1929. 66 marks (\$16.00).

This expensive volume illustrates the hazards of attempting to revise an elaborate work, of unusual importance and established reputation, without careful planning, financing and administration beforehand. The editor, a well-known investigator of Chinese medicine, professes to present herewith a "new" edition of Hirsch's incomparable *Biographisches Lexikon* (6 vols. Wien & Leipzig, 1884-8). What he gives is really a photographic interfusion of this great work with the subsequent items in Pagel's *Lexikon* of 19th century physicians (Berlin & Wien, 1901), with some inserted additional matter and 64 portraits. The editor states that he took over the difficult task with reluctance and for the sole reason that Hirsch has been long since out of print. With no provision for an adequate editorial staff and with the assistance only of Lejeune (Cologne), Vierordt (Tübingen) and a few other colleagues, he soon found himself confronted by insuperable difficulties. A literal reproduction of Hirsch's text, with additions and emendations in the final volume, was at first contemplated, but soon abandoned as being complicated and impracticable. On the other hand, a thorough-going revision would be conditioned by shrewd financing, expert staff-work and expensive printing. The plan of combining Hirsch and Pagel by photographic reproduction of individual biographies, alphabetically arranged, with occasional insertions of new matter, was therefore hit upon as a last resort against the high cost of printing. The results are before us.

The first thing noticeable is that neither Hirsch nor Pagel, not to mention Wernich or Gurlt, are mentioned on the title-page of what is, in the main, a photographic reproduction of their compilations. Next, the list of biographical sources is reproduced *verbatim* from Vols. I and

VI, with no sign of the existence of additional matter. Turning now to the text, we find the initial biographies from Aaskow to "Arabian Physicians" entered consecutively from Hirsch (Vol. I and Supplement, Vol. VI), but of Pagel's entries, Abadie (Charles), Abel (Karl), Abeles (Marcus), Aberle (Karl), Afanasjew (Eugen), Albanese (Enrico), Alberti (Gustav), Albertotti (Giuseppe), Albu (Albert), Alexander (Arthur), Almquist (Ernst), Althaus (Julius), Angelucci (Arnoldo), Anton (Gabriel), are omitted. Some of the Arabians, e. g. Abulkasim, Averroes, Avicenna, are transferred from Hirsch's Arabian chapter to their proper places in the alphabetic sequence, but the notice of Averroes is much clipped, while that of Avicenna is new and rather good. The "D" in D. Hayes Agnew is omitted and the sketches of Sir Clifford Allbutt, J. S. Billings and others, deceased after Hirsch's time, remain as Hirsch printed them, without date of death or any attempt to complete their life-histories. The new material is confined mainly to Arabic, Hindu, Chinese and Japanese physicians. The exclusion of physicians who flourished "after 1880" is ambiguous and sure to be inconsistent. The prospective inclusion of these and of subsequent (20th century) names in two final volumes is a large order: no two volumes could possibly contain them. All this points to bad management and a superficial estimate of the situation (bad generalship) at the start. That the volume is not up to accepted and expected standards of Germanic thoroughness and accuracy is the sentiment even of Haberling and other German reviewers. The portraits, four to a page and many of them reproduced from Pagel, are, in the main, excellent, notably the newer pictures of Erwin Baelz, Friedrich Bezold and Sir William Bowman. The management of the final volumes, to contain sketches of recent and living physicians, has been entrusted to a careful worker, Dr. I. Fischer, of Vienna, who has already submitted tentative lists of American physicians to the undersigned and who might be helped very materially by the transmission of lists of outstanding names, clippings, written sketches, Who's Who's and biographical reprints.

Whatever assistance of this kind may be forthcoming will be *pro domo sua* or *pour l'honneur du pays*. As it stands, this initial volume is disappointing, as being full of uncompleted biographic sketches of physicians who were still living in 1888. It is to be hoped that some effort will be made to repair these omissions and to complete the subsequent notices in Vols. II-VI by authenticated data, without which such an imposing and expensive work cannot be recommended as up to recent standards.

F. H. GARRISON.

RESOLUTION PASSED BY THE COUNCIL ON THE
22ND OF JANUARY CONCERNING THE
CLAUSE IN THE TARIFF RELAT-
ING TO OBSCENE BOOKS

At its regular meeting held on the 22nd of January, 1930, the Council of the New York Academy of Medicine on the recommendation of the Library Committee unanimously adopted the following resolution:

RESOLVED that The New York Academy of Medicine register its formal protest against the wording of section 305 of the H. R. 2667 (Tariff Bill) prohibiting the importation of any obscene book, pamphlet, paper, etc., in that no exception is made for the importation of medical and other scientific publication for educational and scientific purpose. Such publications are essential for Libraries and educational institutions, and the wording of this section should be such that these institutions are exempted from the prohibition. Otherwise the Customs officials are liable to be extremely strict in excluding such works in order that they may not be subject to the severe penalties attached to the conviction of any person knowingly aiding or abetting any person engaged in any violation of this law. It was moved and carried that this resolution be published in the *Bulletin* and be sent to the American Medical Association, to Universities, and to the American Library Association.

THE SPAS COMMITTEE

SUMMARY OF THE REPORT AND RECOMMENDATIONS

1. The spas of Europe provide desirable and effective means for the treatment and relief of many chronic ailments.

2. Most of the spas are attractively developed, and many of them are situated in beautiful natural surroundings and enjoy a good climate. The physicians practicing at the spas have acquired either by experience, or study, or both, a special technique in the employment of the natural mineral waters for therapeutic purposes. In the large majority of cases, the patients are referred by their own physicians and bring with them clinical and laboratory data bearing on their condition. In practically all instances they remain under the supervision of the spa doctors during the period of their stay at the health resort. The regimen at the spas embraces, in addition to medication: diet, exercise, rest, physical therapy, suggestion, the enjoyment of music and other diversions, as well as the bathing in and the drinking of the mineral waters. This regimen varies in accordance with the condition of the patient, and is usually laid out in great detail, and the patient is impressed with the importance of following it in every particular.

3. In all of the well organized spas there are institutes of hydrology where the physical and chemical problems of the spas are studied continuously. In connection with these institutes, clinical and x-ray laboratories are maintained for the use of the practicing physicians. As a rule the establishments for physical therapy constitute a part of the spa organization, although the Zander institutes are in many places operated independently. All of the physical therapy establishments are under the direction of specially trained physicians and attendants.

4. The bathing establishments and all their accessory departments function in the mornings and afternoons. The charges are usually somewhat lower in the afternoons.

All the spas divide their facilities into two or three "classes" and the rates charged vary in accordance with the degree of comfort or luxury provided. The character of the essential services remains the same, the classification affording an opportunity for the impecunious patients to enjoy the benefits of the spas at a lesser cost. In many of the spas the cheaper accommodations are used to a much greater degree than the higher priced ones.

5. At almost all of the spas a special tax is levied on all temporary residents which varies in amount in accordance with the economic status of the patients, as determined by the hotel or boarding house in which they reside at the spa, and their occupations. Persons following certain occupations, such as teachers and government employees, are entitled to lower rates, and physicians and their families are exempt from all dues or charges of any kind. The proceeds of the "cure-tax," as the Germans call it, go towards the improvement of the town or village where the spa is situated.

6. The fact that constantly increasing numbers of patients patronize the spas must be taken as an indication that hundreds of thousands of people consider the effects of the treatment at the spas beneficial. The clinical testimony is overwhelming in amount and variety—much greater than the medical profession of the United States is aware of. Numerous textbooks of balneology have been published, some by eminent men. In all of the countries of Europe, balneology is taught in the medical schools as part of therapeutics or pharmacology, and in a number of important universities, chairs of balneology or hydrology have been founded. In most of the countries of Europe, balneological societies have been organized, and there exists an *International Balneological Society* which holds meetings at stated intervals. There exist publications devoted exclusively to balneology. Serious research has, of late, been started both in the chemistry of the natural mineral waters, and in the clinical effects of the employment of these waters.

7. The hurried work during the peak months of the season and the paucity of their records make strictly scientific work on the part of the majority of spa physicians almost impossible. The members of the Committee are therefore inclined to regard most of this testimony as of little scientific value, and at times perhaps biased, although they realize that in many conditions the employment of spa therapy may have a favorable effect. When treatment consists, as it usually does, of a variety of procedures, it is impossible to evaluate with any degree of accuracy the effect of any one constituent element. What part the waters play in spa therapy has not been established. None of the natural mineral waters has specific action on any pathological condition. When taken internally, the waters have aperient, cathartic, or diuretic action, depending on the predominant chemical ingredients. When employed externally, their peripheral action depends on the temperature of the baths, the chemical composition, and the "radio-activity" of the waters. Certain effects of carbonated baths have been proven in a definite objective manner. It is claimed that the CO_2 gas is absorbed through the skin and a great deal is made of this, as well as of the catalytic action of the natural mineral waters, which was established by the employment of the modern methods of chemical analysis. Whatever may be the physiological or biochemical action of the waters, the fact remains that the regimen at the spas, taken as a whole, exercises a beneficial effect on thousands of sufferers. Admittedly, there are conditions which cannot be changed by any form of therapy, but if multitudes of patients can be even temporarily relieved, a very distinct service has been rendered. It behooves the medical profession of America to take a more open-minded attitude towards balneology than has been done hitherto. Incidentally, the spas of Europe provide an opportunity for periodic or even annual health examinations, the value of which in recent years has been recognized and strongly emphasized to the laity.

RECOMMENDATIONS

1. The Committee believes that something of the type of the conservative spas of Europe should be developed in connection with Saratoga Springs, in view of the existence there of springs whose chemical composition is considered suitable for the treatment of certain conditions. The Committee is of the opinion that development should proceed in a very conservative way. No attempt should be made to advertise Saratoga in the highly objectionable and misleading manner which is being almost universally employed by the spas of Europe.

2. It is known that the saline alkaline waters of Saratoga Springs have a diuretic and aperient effect, and there is justification for the belief that the naturally carbonated waters of Saratoga have a physiological effect on the circulation and that this effect, in selected cases of circulatory disease, is beneficial. In the judgment of the Committee, the situation and climate of Saratoga are ideal for the care of certain forms of heart disease from May to November.

No attempt should be made to regard Saratoga as a "cure-all." Its development should be limited to the treatment of persons chronically ill; this need is particularly felt for patients with diseases of the circulation, for the prevention of heart failure and the building up of cardiac reserve, for patients with neurasthenia and the psychasthenias, and with certain chronic metabolic diseases.

3. The development of Saratoga should proceed along the lines of well considered policies, administrative and medical. The carrying out of the plan should be gradual, certain features of it being developed ahead of others.

4. The two immediate needs are: the formulation of a wise medical policy, and the development of the environment.

5. With reference to medical policy, the Committee recommends:

(a) That a conference be arranged with the officers and trustees of the Medical Society of the State of New York to secure their advice concerning projected developments;

(b) That conferences be held with those among the local practitioners at Saratoga who have shown interest in the development of Saratoga, and in the science and art of balneology;

(c) That steps be taken toward the establishment of a scientific institute at Saratoga whose functions should be threefold:

The first function would be to provide modern laboratory facilities for diagnostic work, this to include facilities for radiology, cardiology, basal metabolism, serology, bacteriology, and other diagnostic aids.

The second department, closely linked to the laboratory, would be devoted exclusively to research work in balneotherapy and other methods of treatment of chronic disease. This department would offer the physicians of the state educational opportunities for the study of the nature and treatment of chronic diseases.

The third department would be given over to the study of the geology of the district and the physical and chemical properties of the waters; this department to be under the direction of a competent modern chemist, while the laboratory and research divisions to be under the direction of a skilled medical director with a good clinical background, and of a research type of mind. The research and experimental work, as well as the educational facilities, might be associated with one or more medical schools of the State. A direct affiliation with the Albany Medical School readily suggests itself because of its proximity to Saratoga Springs.

The relationship of the institute to the medical practitioners should be worked out in conference with representatives of the State Medical Society and of the local physicians.

(d) In connection with this institute, a fully equipped department of physio-therapy should be developed. It should comprise facilities for the various kinds of physio-thermo-hydro- and electro-therapy, as well as inhalatoria, gas baths, sun baths, open air as well as enclosed gymnasias, and other features of special therapy.

(e) The institute should be built on state property in close proximity to the bathing establishments. In its directly utilitarian aspects, i. e., in its laboratory work and its physio-therapeutic equipment, it should be built and maintained by the State, although in all probability the charges made for service rendered will cover the cost of its maintenance. For the research work, which would be one of its outstanding features, continuous maintenance should be assured. This institute should be managed by a board of trustees, or a board of scientific control, appointed in a manner which will properly safeguard its purpose.

(f) The selection of the medical director and his staff should be the responsibility of the board of trustees or the board of scientific control.

(g) It would, perhaps, be desirable to consider a plan whereby fellowships would be granted to young physicians for travel and study abroad, and to organize, at Saratoga or elsewhere, courses in balneo-therapy when the opportune time comes.

(h) The clinical material for research purposes could come from both the ordinary patients and the patients who would be accommodated free of charge, or at greatly reduced cost. A rule should be adopted that no one could pursue a course of treatment at Saratoga without medical direction by physicians recognized by the management of the spa.

6. *Administrative Policies.* It is not perhaps within the province of this Committee to advise concerning administrative and economic policies, but there are certain features which the Committee wishes to impress upon those responsible for the development of Saratoga. One of these

is the making of the environment as attractive as possible. The members of the Committee are convinced that a great deal of the popularity and effectiveness of the spas of Europe is due to the amenities they offer. The development should provide for:

- (a) An administrative building on state property;
- (b) An attractive central drinking hall;
- (c) Appropriate sanitarium facilities on state property near the baths;
- (d) Adequate living accommodations for patients of different economic levels;
- (e) A casino with theatre and concert facilities, reading and writing rooms, tea rooms, and the like;
- (f) Covered promenades like those in the various European spas;
- (g) The laying out of a golf course on state property;
- (h) The existing walks should be developed and some attractions, like open air concerts or tea rooms, should be located at the end of each walk. This would render the use of these walks much more popular.
- (i) Bus lines should be established between Saratoga and Lake George. In winter time facilities for winter sports should be provided.
- (j) A great deal of capital will be necessary to develop Saratoga Springs, and a considerable sum needed annually for the payment of salaries of the staff. The process of development should be gradual and spread over a number of years. The question of how far the State should involve itself financially is a matter to which a great deal of thought should be given. The proper exploitation of collateral privileges, such as the sale of bottled waters, the development of sanatoria, hotels, golf links, restaurants, the casino, and the like, on state property, through concessions, offers opportunities for income and should receive thoughtful consideration.

(k) The almost universal practice in Europe of the town or state assessing every temporary resident at the spa with a tax and employing the proceeds therefrom for the improvement of the thermal station and for scientific research, is likewise recommended for consideration.

MALCOLM GOODRIDGE, M.D., Chairman

L. W. GORHAM, M.D.

MILTON B. ROSENBLUTH, M.D.

JOHN WYCKOFF, M.D.

E. H. L. CORWIN, Ph.D., Secretary

CATALOGUE OF FOURTH ANNUAL
EXHIBITION OF WORKS IN THE PLASTIC AND
GRAPHIC ARTS BY AMERICAN PHYSICIANS
UNDER THE AUSPICES OF THE NEW YORK PHYSICIANS
ART CLUB

Held at the New York Academy of Medicine
February 15th to March 15th, 1930

INTRODUCTION

JOHN A. HARTWELL

A productive avocation is the hall mark of the cultured man.

That the medical profession of New York is sufficiently engaged in the avocation of the fine arts to be able to present to its members and the public this fourth annual exhibition under the auspices of the New York Physicians Art Club is manifested evidence that the cultural side of busy practitioners is not neglected.

This is of more importance than may appear at first glance, in that culture argues a broad outlook on all problems and such an outlook is particularly demanded at the present time for a wise guidance in the trend of advance which the profession is just now called upon to furnish.

There is a tendency to question the continuance of the high ideals which have been the birth right of physicians from earliest times and it is pleasing to know that such a number of our confreres are cultivating the ideal by its expression in the plastic and graphic arts.

The introductions to the earlier catalogues of this exhibition have enumerated some of the classical names of medical men in these fields. Such are exceptions and each generation produces not more than one or two.

To find the names of more than fifty of our associates in this catalogue of the Exhibition is matter for congratulation.

The Academy takes great pleasure in extending its facilities to the Art Club in the belief that these Exhibitions are one means of elevating the standards of medical practice, an avowed function of the Academy.

LIST OF WORKS

AUSTER, LIONEL (New York City)

- Camera Portrait. Max Auster
- Camera Portrait. David Beck
- Camera Portrait. Solon
- Camera Portrait. Albert Epstein
- Camera Portrait. Lillian
- Camera Portrait. Otto Schultze
- Camera Portrait. Leigh Hunt
- Camera Portrait. Gilbert Gabriel

AYER, J. C. (New York City)

- The Gold Coat
- Study
- Portrait

BANCEL, HENRY A. (New York City)

- Old Colonial House, Nantucket
- Still Life
- An Old Homestead, Nantucket
- A Fishing Boat, Nantucket
- Cottage at Siasconset

BARRINGER, B. S. (New York City)

- Deserted House
- Night Shadows
- Haunt of the Alley Cat
- Spring
- Winter

BARRINGER, EMILY DUNNING (New York City)

- Garden Gate (Outside View) Designed and built by Emily Dunning Barringer
- Garden Gate (Inside View) Designed and built by Emily Dunning Barringer
- Floor Plans of Country House: Ten Rooms, Three Baths, One Lavatory, One Two Car Garage. Designed and built by Emily Dunning Barringer and Benjamin S. Barringer

Front Door of House: Designed and built by Emily Dunning Barringer and Benjamin S. Barringer

Corner of Living Room: House designed and built by Emily Dunning Barringer and Benjamin S. Barringer

Looking Down into Living Room from Gallery: House designed and built by Emily Dunning Barringer and Benjamin S. Barringer

Dining Room: House designed and built by Emily Dunning Barringer and Benjamin S. Barringer

Living Room Showing Staircase to Gallery: House designed and built by Emily Dunning Barringer and Benjamin S. Barringer

One of the Bedrooms: House designed and built by Emily Dunning Barringer and Benjamin S. Barringer

BAUCH, SOLOMON (Stan.) (New York City)

Houses with Owls on Chimneys (Loaned by the Bourgeois Galleries)

Group of Houses, Woodstock, N. Y. (Loaned by Bourgeois Galleries)

Lady at the Piano (Loaned by Bourgeois Galleries)

Lady Reclining on Couch (Loaned by Bourgeois Galleries)

Woodstock Hills

BEEKMAN, FENWICK (New York City)

The Boatman

The Salmon River

The Game Warden

The Game Warden's Hut

Portrait

Through the Door

BELDEN, WEBSTER (New York City)

La Tete Rouge

BERKOWITZ, JOSEPH J. (New York City)

Numismatist

BINKOWITZ, BARNETT (Brooklyn, N. Y.)

Death Mask of Kainz (chalk)

Death Mask of Kainz (charcoal)

Death Mask of Kainz (oil)

BURKE, EDGAR (Jersey City, N. J.)

Pintails

Trout Flies

Ruffed Grouse in October

Cock Pheasant

Green Winged Teal

Woodcock

Cock Pheasants

CARLINO, CHARLES I. (New York City)

The Medical Student

Waiting in the Studio

CHAMPLIN, H. H. (New York City)

Spring

Sails

Escape

Autumn (Loaned by E. Conzelman)

DICKINSON, ROBERT L. (New York City)

Sketch Method I, Fountain Pen Point. Three Trees, Ausable, Adirondacks

Sketch Method II, Fountain Pen as Brush Using its Back. Willows and Elm, Yarmouth, Maine

Sketch Method III, Fountain Pen Outdoor drawing. Sky Line from Roof of Academy of Medicine

Sketch Method IV, Pocket Crayons on Erasing Paper. Washington in Springtime

Sketch Method V, Tracings as Copy for Reproduction. Studies for New Seal for Academy of Medicine

Sketch Method VI, Medical Bookplates made from Old Medical Woodcuts

DOERFLER, W. J. (Hastings on Hudson, N. Y.)

Box

Garden Sketch

DOLGOPOL, VERA B. (New York City)

The Parasols

The Path

ELLIOT, GEORGE R. (New York City)

Return of the Chief to Moreland's Falls

FISCHER, HERMANN (New York City)

Pine Woods

Early Morning, Menemsha Bay

Bathing Beach

Hillside

A Clear Day

Early Autumn

Canadian Lake

FISCHER, MARTIN (Cincinnati, Ohio)

In a Mexican Market

Quiet Sails

Jewelled Towers of El Carmen, Mexico

Coal

FREEMAN, ALPHEUS (New York City)

The Rohilla, Halesite, L. I.

Front Street, So. Jamesport, L. I.

House at Cold Spring Harbor, L. I.

In Liguria, Italy

Scallop House, So. Jamesport, L. I. (Loaned by Mrs. David Cory)

Walt Whitman's Homestead, Huntington, L. I. (Loaned by Dr. Walter P. Anderton)

FRIDENBERG, PERCY (New York City)

Construction I, Medico Building

Construction II, Squibb Building

FRIEDMAN, MILTON (New York City)

Lamp Shade

GALDSTON, IAGO (Brooklyn N. Y.)

East River

Trudeau Land

Provincetown

East Gloucester

Brooklyn Bridge

"O, Wad Some Power the Giftie Gie Us"

HANNSON, K. G. (New York City)

Boys Head

Girls Head

HEATON, C. E. (New York City)

Water Color No. I

Water Color, No. II

Water Color, No. III

HUGHES, FREDERIC J. (Plainfield, N. J.)

Still Life

Mimosa

Anemones

HUNT, LEIGH (New York City)

The Model

Peconic

Oaks

HIRSCH, I. SETH (New York City)

Self-Portrait

HUTTON, G. E. (New York City)

Landscape

Landscape

Still Life

Portrait Study

KAPLAN, M. (New York City)

Solar Eclipse

N. W. Corner, Lake Louise

Nippon

The Fall of the House of Usher (From the Story by E. A. Poe)

Maine Coast

Winter

Discovery of Little America, 1929

Near Amalfi

The Pines
 Speculator Lake, N. Y.
 African Swamp
 "Nur Wer Die Sehnsucht Kennt"

KEYES, STANLEY J. (New York City)
 Out Beyond the Sunset, If I Could Find the Way (Maisfield)
 Sentinels of the Night

KILMER, T. W. (New York City)
 Linsly R. Williams, M.D.
 J. G. W. Greeff, M.D.

LAVANDERA, MIGUEL (New York City)
 Fruit
 Portrait
 Flowers

LOMAX, HOWARD E. (Albany, N. Y.)
 The Skull
 The Ruin
 When the Moon Peeps
 Quick Lunch
 Spring Musings

LILIENTHAL, HOWARD (New York City)
 Moose
 Lamplight

LYNN, ETHEL (Mrs. Harlo Lynn, San Francisco, Cal.)
 A Louisiana Bayou
 Paloverde and Smoke Bushes, Arizona
 A Rocky Mountain Canyon
 Cactus and Mesquite, Texas
 Bluebonnet Brook, Texas
 A Bright Morning, Texas

McCREEDY, JAMES A. (New York City)
 White Elephant. In Ivory—Soap. Sculpture
 The Thinker
 Young Hickory Wood, Early Spring
 End of a Perfect Day
 A Gray Green Morning
 Judge Brown of Ohio. Portrait Bust
 An Old Mill
 "A Negro Speritual, Passin' By"
 A Sylvan Stream. Late Autumn

MILLER, SALLIE W. (Slaton, Texas)
 The Valley Road
 Spanish Moss

MOELLER, HENRY N. (New York City)
 Fanita of the Larchmont Yacht Club

MOSHER, HARRIS P. (Boston, Mass.)

English Field, Malvern Wells

MORROW, B. F. (New York City)

Moonlight Rhythm

Anglers

NILSON, ARTHUR (New York City)

The Glass Jar

Inferno

Going Up

Portrait

The Milkmaid

Bongos, Port of Spain

OASTLER, FRANK R. (New York City)

Columbian Ground Squirrel

Black Bear

Wild Buck Antelope

Rocky Mountain Rams at Rest

Rocky Mountain Rams

OPITZ, R. BURTON (New York City)

Cornfield

Mountain Lake

Woodland Lake

PATTERSON, H. S. (New York City)

Evening, Arizona Desert

Morning, Arizona Desert

Lake Agnes, Alberta, Canada

Bow River, Alberta, Canada

PERKINS, CHARLES W. (Norwalk, Conn.)

A Winters Night, Silvermine, Conn. (exposure by Moonlight)

PIERCE, GEORGE H. (New York City)

Woodland

Landscape

Design for Wallpaper

Summer Afternoon

RACHLIN, LOUIS (Brooklyn, N. Y.)

My Daughter Ruth

Fluroscopy to the Well Regulated Eye

RICHARDSON, H. B. (Darien, Conn.)

Motor Boat

Figure

Still Life

ROHDENBURG, G. L. (New York City)

Mattituck Inlet

Torso

Sailor Beware

Firelight

ROSEN, ISADORE (New York City)

Window Study

Roses

Red Tulips

Tulips

SCHROEDER, LOUIS C. (New York City)

Portrait Bust of a Boy

SEYMOUR, FRANCIS I. (New York City)

Painted Screen

SMITH, ALONZO DeGRATE (New York City)

Still Life

Still Life

STARKE, G. (Glen Ridge, N. J.)

White Face Mountain from the Wilmington Notch in the Adirondacks

Ex Sultan's Palace Opposite Constantinople

Ex Sultan's Gardens, Constantinople

Cathedral in Milan, Italy

Grand Canyon of the Colorado

Autumn Scene in the Adirondacks

SWEET, J. E. (New York City)

Exhibit of Jewelry

TAYLOR, KENNETH (New York City)

Interior

Sun Flowers

The Farm

Rocks

Devils Gage

THORNHILL, G. F. (New York City)

Horses

Decorative Screen

WIENER, RICHARD G. (Florence, Italy)

Still Life

Still Life

Still Life

WOLF, MAX (New York City)

Washing Day

Winter

Night

WOLF, BERAN W. (New York City)

Skater

Nocturne

Allegro

Mater Dolorosa

Unicorn

JAEGER, CHARLES (New York City)

Gum Prints of Columbia University

Memorial Gate

Observation

St. Paul Chapel

Entrance to Avery Library

Looking Towards Library

KRIMSKY, EMANUEL (Brooklyn, N. Y.)

Meditations

Mother and Child

Simple Nature

Peaceful

HARTSHORN, MORGAN (New York City)

Birch Tree

Woodmont Shore

Woodland Path

EGHIAN, SETRAC G. (New York City)

Among the Rocks, East Chatham

Bronx River

A Land Mark, Old Chatham

Bronx River

RECENT ACCESSIONS TO THE LIBRARY

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PROCEEDINGS OF ACADEMY MEETINGS

JANUARY

STATED MEETINGS

Thursday Evening, February 6, at 8:30 o'clock

Program presented in cooperation with the
Sections of Pediatrics, Otology, and Laryngology and Rhinology

ORDER

- I. EXECUTIVE SESSION
Election of Fellows
- II. PAPERS OF THE EVENING
 - a. Indications for, and end results in, tonsil and adenoid surgery,
David H. Jones
Discussion, William P. St. Lawrence
 - b. Management of otitis media in children, Edmund P. Fowler (by invitation)
Discussion, Herbert B. Wilcox
 - c. Sinusitis in children, Lewis A. Coffin
Discussion, Charles Hendee Smith

Thursday Evening, February 20, at 8:30 o'clock

THE FIFTH HARVEY LECTURE

"Relations of the activity of the pituitary and thyroid glands"

PHILIP E. SMITH

Professor of Anatomy, Columbia University, College of Physicians and Surgeons

G. CANBY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for February.

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, February 4, at 7:45 o'clock

ORDER

- I. PRESENTATION OF PATIENTS
 - a. Cases from the New York University Skin Clinic
 - b. Cases from the Bellevue Hospital Skin Clinic
- II. MISCELLANEOUS CASES
- III. DISCUSSION OF CASES
- IV. EXECUTIVE SESSION

Note: Examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, February 7, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Suppuration of lung, empyema, bronchial fistula, excision of involved lung; cure, Edwin Beer
 - b. Cases (4) illustrating late results after lobectomy, Howard Lillenthal
 - c. 1. Multiple stage lobectomy for unilateral bronchiectasis
 2. Multiple stage cauterly pneumocotomy for bronchiectasis of the whole right lung, Pol. Coryllos
- III. PAPER OF THE EVENING

Multiple stage lobectomy in the treatment of bronchiectasis, Pol. Coryllos
- IV. GENERAL DISCUSSION

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, February 11, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION

Demonstration by synchronization. Radio Corporation of America

Moving pictures of neurological cases from Montefiore Hospital, S. Philip Goodhart

Discussion, James S. Edlin (by invitation)
- III. Clinical Presentation

Acute hemorrhagic meningitis, Irving H. Pardee
- IV. PAPER OF THE EVENING

The value of encephalography in the diagnosis of intracranial lesions, Charles H. Frazier, Philadelphia (by invitation)

Discussion, Foster Kennedy, Leopold Jaches
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Instead of the regular meeting on February 13, the Section will combine with the Sections of Otology and Laryngology and Rhinology in presenting the Stated Meeting of February 6.

SECTION OF OTOTOLOGY

Instead of the regular meeting on February 14, the Section will combine with the Sections of Pediatrics and Laryngology and Rhinology in presenting the Stated Meeting of February 6.

SECTION OF OPHTHALMOLOGY

Monday Evening, February 17, at 8:30 o'clock

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Xerosis of the conjunctivae, William Brown Doherty
 - b. Exfoliation of the anterior crystalline lens capsule (with slit lamp), Daniel B. Kirby
 - c. A case of questionable retinitis pigmentosa, Edward Bellamy Gresser (by invitation)
 - d. Unilateral exophthalmos with spontaneous prolapse, Hugh S. McKeown (by invitation)
 - e. An unusual case of conjunctivitis, Nathan Berger (by invitation)
 - f. Tumor of the iris; biopsy, Charles Littwin
- III. DEMONSTRATION
Acute tuberculous periphlebitis of the retina and optic nerve (lantern slides), Isidore Goldstein, David Wexler (by invitation)
- IV. PAPER OF THE EVENING
Some practical procedures of Dr. Harold Gifford, Sanford R. Gifford, Chicago (by invitation)
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF MEDICINE

Tuesday Evening, February 18, at 8:30 o'clock

ORDER

- I. PAPERS OF THE EVENING
 - a. Observations on angina pectoris of various origins, Emanuel Libman
 - b. Principles of digitalis dosage, Harry Gold
- II. DISCUSSION
Harold E. B. Pardee, M. A. Rothschild, B. S. Oppenheimer, Lewis A. Conner, Herman Mond

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, February 19, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Preliminary report on a new local anesthetic (Nupercain), A. M. McLellan (by invitation)
Discussion, Howard S. Jeck
 - b. A post-operative tuberculous chronic vesico-cutaneous sinus cured by roentgen rays and radiant light, V. C. Pedersen

III. PAPERS OF THE EVENING

- a. Diagnosis and treatment of tuberculosis of the urinary tract, B. A. Thomas, Philadelphia (by invitation)
 - b. Diagnosis and treatment of tuberculosis of the genital tract, J. D. Barney, Boston (by invitation)
- Discussion, Oswald Schwartz of Vienna, John S. Read, Abraham Hyman, Benjamin S. Barringer, Howard S. Jeck, Moses Swick, B. A. Thomas, J. D. Barney

IV. GENERAL DISCUSSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, February 21, at 8:30 o'clock

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Dislocation of 5th and 6th cervical vertebra. Open operation
 - b. Long-standing non-union of the tibia. Union by Monssen's treatment
 - c. Osteochondral fracture of the knee joint
 - d. Reconstruction of the anterior crucial ligament. Two cases, Arthur Krida
- III. PAPERS OF THE EVENING
 - a. Pathological fractures in primary bone tumors of the extremities, Bradley L. Coley, George S. Sharpe (by invitation)
 - b. Tennis elbow, Kristian G. Hanssen (by invitation)
 - c. Reconstruction of the anterior crucial ligament, Arthur Krida
- IV. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, February 23, at 8:30 o'clock

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING

Maternity work of the frontier nursing association in the Kentucky mountains, Mary Breckenridge, R.N.

Discussion, George W. Kosmak, Walter C. Klotz
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

The regular meeting will not be held on February 26 for the reason that the Section combined with the Sections of Pediatrics and Otology in presenting the Stated Meeting of the Academy on February 6.

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, February 27, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. Studies in isohemagglutination, Alexander Weiner (by invitation),
Max Lederer, Silik H. Polayes (by invitation)
- b. Splenomegaly due to portal phleboscrosis, Sampson J. Wilson (by
invitation)
- c. Chronic ulcerative colitis with special reference to bacteriology and
vaccine therapy, William Z. Fradkin (by invitation)
- d. Biliary and hepatic factors in peptic ulcer, Benjamin N. Berg
- e. A case of subacute bacterial endarteritis of pulmonary artery in an
infant with congenital heart disease, David Perla

II. READING OF THE MINUTES

LEILA CHARLTON KNOX, President St. Luke's Hospital

BERYL H. PAIGE, Secretary The Presbyterian Hospital

NEW YORK MEETING

of the

SOCIETY OF EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday Evening, February 19, at 8:15 o'clock

(Program incomplete)

- I. Bacteriophage in relation to healing of osteomyelitis, Marjorie B.
Patterson, F. H. Albee
Introduced by W. J. MacNeal
- II. The electric charge of Mosaic virus particles, P. K. Olitsky, D. C.
Hoffman
- III. Electrophoretic mobility velocities of rough and smooth avian and
bovine tubercle bacilli, Morton C. Kahn, Helen Schwarzkopf
- IV. Observations on the pathogenesis of the myeloid leucemia of fowls,
J. Furth
- V. Changes of blood gases and lactic acid after exercise in patients with
rheumatic heart disease, H. W. Schmitz, Elizabeth Sherman
Introduced by R. H. Halsey
- VI. Water-soluble sugars obtained on hydrolyzing phosphatides from
human and avian tubercle bacilli, R. J. Anderson, E. G. Roberts,
A. G. Renfrew

- VII. Local organ hypersensitiveness: Experimental production in the rabbit eye, David Seegal, Beatrice C. Seegal
Introduced by W. W. Palmer

Peyton Rous, President

A. J. Goldbloom, Secretary

FELLOWS ELECTED MARCH 6, 1930

Raphael Bendove.....	450 Audubon Avenue
Eli Goldstein.....	115 East 89th Street
Richard Joseph McDonald.....	294 Broadway, Paterson, N. J.
Harold Russell Merwarth.....	225 Lincoln Place, Brooklyn
Peyton Rous.....	125 East 24th Street
William Hoy Stoner.....	80 Beckman Street
Michael Vinciguerra.....	410 Westminster Avenue, Elizabeth, N. J.
Aaron V. Weinberger.....	73rd Street and Broadway

CORRECTION

In the February number of the Bulletin (2nd Ser., Vol. VI, No. 2) Page 126, third paragraph, fifth line, should be "1000 B. C. to 800 A. D.," instead of "1000 to 800 B. C."

Page 126, fourth paragraph, first line; also page 127, second paragraph, first line, should be "Susruta" instead of "Susrada."

Page 128, second paragraph, third line, should be "Sir Ronald Ross" instead of "Sir Roland."

Page 129, second paragraph, first line, should be "Colonel MacPherson" instead of "Colonel MacFerson."

DEATHS OF FELLOWS OF THE ACADEMY

CHARLES EDWIN ATWOOD, M.D., 40 East 54 Street, New York City; graduated in medicine from Bellevue Hospital Medical College, New York City, in 1883; elected a Fellow of the Academy January 4, 1906; died, February 19, 1930. Dr. Atwood was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Psychiatric Society and a member of the Neurological Society.

LOUIS GABRIEL KAEMPFER, M.D., 17 East 84 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1905; elected a Fellow of the Academy March 3, 1910; died, February 17, 1930. Dr. Kaempfer was a member of the Society of Associated Alumni of Mount Sinai Hospital.

MAXIMILIAN LEWSON, M.D., 338 West 84 Street, New York City; graduated in medicine from New York University, New York City, in 1897; elected a Fellow of the Academy, January 5, 1911; died, February 11, 1930. Dr. Lewson was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, Surgeon to People's Hospital and Associate Surgeon to Polyclinic Hospital.

FRANK WILLIAMS OLDS, M.D., Williamstown, Massachusetts; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1880; elected a Fellow of the Academy, December 6, 1883; died, February 10, 1930. Dr. Olds was a Fellow of the American Medical Association. He was at one time connected with Bellevue and several other leading hospitals in the city.

LUDWIG WEISS, M.D., 42 West 91 Street, New York City; graduated in medicine from the University of Vienna in 1877; elected a Fellow of the Academy December 3, 1903; died, February 14, 1930. Dr. Weiss was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Dermatological Society, a member of the Manhattan Dermatological Society, Chief Dermatologist and Genito-Urinary Surgeon to the German Polyclinic Hospital. He was also Consulting Dermatologist to People's and St. Mark's Hospitals.



CHARLES EDWIN ATWOOD

CHARLES EDWIN ATWOOD

Dr. Charles Edwin Atwood died at his home 10 East 54th Street, New York on Wednesday February 19th, 1930, suddenly from heart failure as he was rising in the morning. He was sixty-eight years old. His whole professional life had been given to the practice of psychiatry and neurology. He gave up active practice some two years ago, but continued to devote himself to the duties of Secretary of the New York Neurological Society, a position held by him for some twenty years, and to the secretaryship of the Section of Historical and Cultural Medicine of the Academy of Medicine.

He was born in Shoreham, Vermont, and entered the Cornell University at the age of fourteen, and after graduation there in 1880 entered Bellevue, receiving his medical degree in 1883. In 1884 the first Civil Service examination ever held in the State of New York for medical appointments in State service was carried out and Dr. Atwood was one of three (among several score applicants) who passed this examination and was appointed Third Assistant Physician at the Hudson River State Hospital for the Insane at Poughkeepsie where he served until the late autumn of 1887. He was then appointed as Assistant Physician under Dr. Blumer at the Utica State Hospital for a period of years, and later became First Assistant at Bloomingdale, acting in that capacity from 1892 to 1905. Resigning then he went abroad for postgraduate work in London and Vienna, and on return took up private practice in New York. He was for years active in the Neurological Department of the Vanderbilt Clinic under Dr. Starr, was neurologist to the Randall's Island Hospital and the New York Neurological Hospital.

He was a member of the American Medical Association, the New York State Medical Association, the Academy of Medicine, the New York Neurological Society and the American Psychiatric Association and was a contributor of many articles on his special subjects to journals and books.

He was efficient and thorough in his work during his whole life of hospital service and private practice, won the devotion of his patients and was esteemed by his medical friends for his gracious and amiable personality.

His wife, Mrs. Helen Jarvis Atwood and a sister, Miss Laura Atwood of Ithaca survive him.

FREDERICK PETERSON

1930

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BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VI

APRIL, 1930

No. 4

ANNUAL GRADUATE FORTNIGHT

*Functional and Nervous Problems
in Medicine and Surgery
October 7 to 19, 1929*

NEUROCIRCULATORY ASTHENIA *

MARCUS A. ROTHSCHILD

Associate Physician, Mount Sinai Hospital

The term Neurocirculatory Asthenia was coined during the World War to designate a symptom complex which had previously been well known and called "Irritable Heart," "Disordered Action of the Heart," "Vaso-Motor Neurosis," "Functional Cardio-Vascular Disorder," and "Effort Syndrome." Most of the earlier references are to be found in American literature. Da Costa during the Civil War wrote a masterly description of this condition and termed it "Irritable Heart." Fürbinger described the condition as it occurred in the German Army in 1870, and Tyson in the British Army during the South African War. The official name in the British Manual was "Disordered Action of the Heart," abbreviated to "D. A. H." Lewis, in his admirable report suggested the name "Effort Syndrome." Before 1918, despite a rather extensive literature on this condition, the medical profession was rather lacking in their appreciation of the frequency and importance of this syndrome. The monograph of Sir Thomas Lewis and the masterly mind and foresight of Major Janeway

* Delivered October 16, 1929.

who was then in charge of the Division of Internal Medicine of the Surgeon General's Office, saved the Expeditionary Force of the American Army from being burdened with thousands of soldiers unfit for combat duty.

It is especially interesting that even though Da Costa and others pointed out that neurocirculatory asthenia was not a condition peculiar to military life, and that the symptoms in most of the cases long antedate military service, this fact attracted little attention. The World War served a purpose in focusing the medical profession's attention on the frequency of this symptom complex in civil life. This lecture tonight emphasizes the profession's interest and the importance of this condition.

Neurocirculatory asthenia is not a clinical entity, but a syndrome with many etiological and predisposing factors. It is not a disease of the heart. Individuals with neurocirculatory asthenia dying from other causes such as accidents or wounds have shown no anatomical lesions of the muscle, the valves, or the blood vessels of the heart.

The name is purely descriptive of the major symptoms which are referable to the nervous and circulatory systems and associated with an increased susceptibility to fatigue. Da Costa's nomenclature "Irritable Heart" is ill chosen as it focussed the patient's attention on the heart and increased the difficulties of the therapeutic problem of persuading the patient that there is no heart affection. Lewis appreciated this and advocated "Effort Syndrome" instead of "Disordered Action of the Heart." His suggestion that the symptoms are brought on or intensified by effort is apt, but used with the implication that the syndrome is identical with that presented by a normal person after severe exertion, in this we do not concur.

GENERAL DESCRIPTION

The affection is characterized principally by a sense of fatigue, breathlessness, giddiness, left chest pain, a consciousness of the heart's action, such as tachycardia,

forcible beating, skipped beats (arrhythmias), general shakiness, fainting, increased susceptibility to cold, sweating, blushing, irritability of temper, sleeplessness, and inability to fix the attention. Not all of these symptoms are present in the same patient, and the individual symptoms vary in their prominence with each case.

AGE

The syndrome is one of youth and early adult life. Bass and Wessler, also Kerley, have described the condition in children. In fact the juvenile cases are identical with those seen in adult life. I have seen the condition at practically all ages, but with decreasing frequency after 30.

SEX

Most of our accurate information has been obtained from males because of the opportunity of examining such large groups for military service. My experience in civil practice coincides with that of Brooks, that sex in itself plays no real rôle in the determination of occurrence of neurocirculatory asthenia.

The symptom complex may be roughly classified into two main groups:

1. Cases following various infections.
2. The constitutional cases.

The post-infectious variety is well known and is commonly seen after influenza or "grippe"—the so-called marked vaso-motor instability, the tendency to sweat, the tachycardia, the fatigue, and at times the giddiness, is a picture very commonly seen. In fact, "grippe" has been described as a three day illness in which a patient believes himself sick, but when he is well, he is sick three weeks. Other infections, such as typhoid, dysentery, chronic sinusitis, other chronic focal infections, and tuberculosis may be associated with, or cause the symptoms.

In the constitutional type comprising about 70 per cent of the cases, no definite pathological condition can be found to which to ascribe the clinical condition. During the World War, the speaker had the opportunity of observing and studying this complex with the British Army at the military heart hospital at Colchester, and subsequently at Camp Upton on Long Island, Camp Devens in Massachusetts, Camp Meade in Virginia, Camp Sherman in Ohio, Camp Sevier in North Carolina, Camps Greene, Wadsworth, Gordon, and Hancock in Georgia and numerous Army posts in the West extending to San Francisco. During the war the condition was found to be prevalent in all armies, Central as well as Allied. Among the Allies, Scotch, Irish, West and East Indians, Australians and New Zealanders were all similarly affected. Similarly no section of the United States was found to be more or less affected.

Contrasting 108 cases personally examined at Camp Sevier with 110 at Camp Devens, no material differences in symptoms or etiology could be found. Of 108 cases at Camp Sevier rejected for neurocirculatory asthenia, fifteen were rejected by the tuberculosis board for active or inactive tuberculosis, and 41 by the neuropsychiatric board alone. Fifty per cent of the cases were farmers. At Devens the same ratio held, but 80 per cent of the cases were clerks or individuals with a sedentary occupation. On analysis of another draft at Camp Sevier of 90 cases, it showed that 46 per cent of the cases were in farmers, that 70 dated their symptoms from childhood or adolescence, that the remaining 20 probably followed infections, 4 after rheumatic fever, 5 after typhoid, 4 after malaria, 2 after measles, 1 after pneumonia, 1 after dysentery, 1 after smallpox.

In 100 cases analyzed by Oppenheimer and the speaker at Colchester, England, 61 were of the constitutional type, and 39 of the infectious. The precipitating causes in the 39 being rheumatic fever, dysentery, prolonged service, gassing or shell explosion.

At Camp Syracuse, 616 cases of neurocirculatory asthenia were recognized in 10,000 men, 200 of these cases were also rejected by the neuropsychiatric board, with the following diagnoses:

Inebriety, heroin or morphia addiction, constitutional psychopathic state, manic depressive insanity, dementia praecox, neurasthenia, psychosis, mental depression, etc.

Of the 100 cases analyzed at Colchester for psychoneurotic factors in their family and personal history, 61 gave a positive family or personal history for psychoneurotic factors. As a contrast, we used Wolfsohn's tables of men invalided for wounds, of whom 18 only presented these characteristics. There was a distinct contrast in the civil occupations of the 61 men with positive personal and family history for psychoneurotic factors, and of the 31 without. The former group followed sedentary and light occupations, whereas in the second group many did heavy work. Group 1 gave practically no combat service while many in Group 2 gave valuable and prolonged service.

An investigation of these two groups for constitutional physical asthenia or constitutional inferiority, showed that 70 per cent from Group 1 presented this condition, and only 12.8 per cent of Group 2.

By the term "constitutional asthenia" is meant a relative inferiority or an anomaly in the assemblage of inherent characteristics both functional and morphologic, which go to make up the organism. Sir William Osler put it picturesquely—"something wrong with the blastoderm." F. Kraus and others have for years studied the question of constitution, and it must be emphasized that apart from neuropsychiatric factors, there is a constitutional tendency which predisposes certain individuals to develop neurocirculatory asthenia. These cases can not be cured by psychoanalysis alone. These cases have an organ inferiority, or as L. Aronson suggests, a decreased constitutional psychological capacity.

The relationship of disturbances of the ductless glands such as the thyroid and adrenal to neurocirculatory asthenia, has given rise to much speculation.

The basal rates of neurocirculatory asthenia cases are normal, there are many symptoms in common with hyperthyroidism such as tachycardia and nervousness. Of 100 men from Etawah County, Alabama, 1 had Graves' disease, 28 had definite goiters, and there were only 3 cases of neurocirculatory asthenia found, and none in the thyroid group. In the present state of our knowledge, we can prove no definite relationship. I have never seen a case of neurocirculatory asthenia develop Graves' disease. The relationship of other glands is equally obscure. The rôle that so-called disturbances of the vegetative nervous system plays in this condition is another fruitful field for speculation. Undoubtedly any of the symptoms can be explained on the basis of a dysfunction of this system.

Psychoneurosis and neurocirculatory asthenia are closely allied. Their exact relationship is difficult to state. Each may exist without the other. However they are frequently, especially in the constitutional types of neurocirculatory asthenia, found coexistent. Psychoneurotics may refer their symptoms to their circulatory apparatus. This group may be cured by proper diagnosis and therapy. Constitutional cases of neurocirculatory asthenia have just causes for anxiety and exhaustion neurosis. The therapy should be devoted especially toward their physical status. Psychoanalysis alone will not cure.

The general wear and tear of life or great national crises may make active a latent neurocirculatory asthenia. Many such types are seen but a careful history will show that the malady pre-existed in a mild form.

RELATIONSHIP TO OTHER DISEASED STATES

There are many gaps in our knowledge. Are these individuals more susceptible to infectious or degenerative disease? Lewis, in following a group after the war found

a much higher percentage of tuberculosis than in a group invalided for other causes. Was the tuberculosis latent and the neurocirculatory asthenia a symptom? Brooks states that men with neurocirculatory asthenia convalesce from wounds slower than normals. Do these cases early develop hypertension and degenerative disease of their hearts and arteries? This is a problem for the future. In my own experience in analyzing and questioning patients with coronary disease and with hypertension, I can trace no distinct relationship. These questions are of distinct importance for public health.

THE PHYSICAL TYPE

The syndrome may occur in any physical type, especially the infectious variety. The constitutional type is seen mostly in the tall, slender, lumbar-lordotic individual; the thorax is narrow and long and rounded in cross-section, the extremities are relatively long, the abdomen is bottle-shaped, they are splanchnoptotic, the skin is soft.

The next commonest type is of coarse build. The chest is broad but flat, the skin coarse, the hands and feet are large. The color is spastic, a pseudo-anaemia. They faint easily.

PSYCHOLOGICAL PECULIARITIES

Among the constitutional type, total abstinence from alcohol and tobacco is common. They do not tolerate stimulants well. A large percentage are unmarried. As a group, they are not very active sexually. Mentally there are two types, the very alert, with a fondness for music, art and literature, and a subnormal class. The condition is fairly common in the constitutional inferior class, used with its psychiatric meaning.

They are courageous and able to perform single big deeds, but do not stand prolonged effort.

SYMPTOMS AND SIGNS

It is because of (1) breathlessness, (2) palpitation, and (3) exhaustion, that most cases appear for examination,

and for these very same reasons that these patients are especially concerned about their hearts.

BREATHLESSNESS

Breathlessness is almost a constant complaint. At rest the respiratory rate is normal or slightly above. During sleep the rate is normal. The response of the respiratory rate to physical exercise or emotional strain is aggravated, rising at times to 60-70 per minute. At times, rates of 200 are seen—the shallow, rapid, hysterical breathing.

PALPITATION

Palpitation is a very frequent complaint. The commonest type is a consciousness of a rapid, forcible heart beat. The rate at rest may be from 70 to 160. Cardiac arrhythmias are not common. Occasionally patients complain of skipping pulse or jumping of the heart, or a peculiar all-gone sensation in the chest. However, most of the milder cases adjust themselves to the accelerated rate; they complain mostly of the variability of their heart rates. Simple change of posture, as from the upright to the reclining may cause a change of rate, of 10-50 beats. Fear, fright, or any emotional stimulus may produce a similar result. More violent effort, such as the usual exercise test of hopping or forward bending, produces an exaggerated response, the heart accelerating rapidly to a rate as high as 160-180, the return to the pre-existing rate being delayed even up to several hours. Associated with this increased rate, are symptoms such as tremor, shakiness, dizziness, sweating and the fatigue is markedly exaggerated. If extrasystoles are present before exercise, they are abolished during the period of rapid rate and may reappear during the slower periods.

PAIN

Pain is a symptom complained of by about half of the cases. At rest, these cases rarely have pain, although many note soreness over the precordial region. After exertion

a sense of uneasiness over the precordium to an actual ache may be experienced. The pain is rarely precordial or midsternal; it is referred to the region of the apex and the lateral chest wall. In many severe cases the reaction simulates a classical anginal type.

FATIGUE AND EXHAUSTION

Fatigue, lassitude even up to exhaustion, are present in practically every case. The fatigue is usually more pronounced in the earlier part of the day, and may be much less as the day goes on. The inability to get going in the early forenoon is a chief source of annoyance. In the military hospitals in making morning rounds before exercise, how frequently repeated were the responses "very shaky, Sir," "pains in chest," "headache," "It's me 'eart and me 'ead, Sir," or "It's me chest and me nerves."

After undue exercise the fatigue may become pronounced even to the stage of exhaustion. Mahon made a study of the early exhaustibility of 50 cases. He found that the amount of work which they could do without exhaustion was distinctly below normal. The pain, however, is rarely constricting, and never awakens the patients at night. Effort increases it or brings it on and it may last for hours or days after violent effort.

Soreness of the skin of the left chest is present in about one-fourth of the cases, and may be a subjective complaint. Meakins and Gunson found hyperalgesia over areas of the left chest in 48 per cent. The area of hyperalgesia is inconstant. In 19 of these cases hyperalgesia was found in a single rib-space, in 5 in 2 spaces, in 15 over 3-5 spaces, in 9 over the greater part of the left chest.

GIDDINESS AND DIZZINESS

Giddiness and dizziness are symptoms present at some time in practically every case. It is noticed especially on getting out of bed in the morning or in changing to the upright position. Emotional or physical effort may ag-

gravate these symptoms. There is a general unsteadiness with inability to focus the attention and to perform co-ordinate acts. As the day goes, these symptoms may improve.

FAINING

Fainting, with or without complete loss of consciousness, is a very prominent symptom.

In the examination of 4217 men of the draft age, about 3 per cent were rejected by the cardiovascular board, and 75 per cent of these rejections, or 108 men for neuro-circulatory asthenia. Fifty-three of these men gave a definite history of fainting, 15 actually fainted during the course of the examination. Fainting may be the first symptom which the patient can remember. A sudden fright, or shock, at the cessation of sudden effort, severe coughing attacks, deep breathing, the effort at stool, the sight of blood, a typhoid inoculation, or a small-pox vaccination are all provocative causes. The actual faint may occur suddenly or there may be some premonitory signs. Many patients have learned this, and sit with their bodies flexed and heads low, which often prevents the actual faint. When the faint occurs suddenly, they may fall and injure themselves. However, in most of the cases some premonitory signs and symptoms are observed, such as a feeling of uneasiness and restlessness, a feeling of coldness with sweating, especially on the forehead. Then dizziness or vertigo follows, at which time the patient responds slowly to questions, the pallor increases, the sweating becomes generalized, and the patient falls with loss of consciousness. The pupils are moderately dilated, the body is limp, occasionally there are some slight body twitchings. The respirations are slow and quiet, the pulse varies from 60 to 30 and becomes imperceptible during the actual faint. The period of unconsciousness lasts from a few seconds to five minutes, the pulse becomes perceptible, at first slow, about 30-40, and gradually increasing in rate, the eyes open, questions are responded to, the body is bathed in a cold perspiration, and there is intense pallor.

We were able to make observations on the blood pressure and pulse, and heart rate before, during and after the attack. Our observations are in accord with those of Lewis and Cotton. A typical example will suffice.

Case 50. Pulse before attack 120. Sight of typhoid inoculation on another man.

Rate 58	Blood pressure 90	
46, 1 minute	Blood pressure 85	
30	Blood pressure 65	
Actual faint		5 minutes
Recovery phase		
Rate 60	Blood pressure 80	
90	Blood pressure 110	
110	Blood pressure 120	

These patients have a history of having fainted from 1 to 100 times. On inquiry as to family history of fainting, 16 gave such a history of one or more members of their families fainting many times.

Many other nervous and mental symptoms are present and often dominate the picture. Tremor is very common; it is a coarser shake than seen in Graves' disease; it is exaggerated by effort and there may be a general ataxia for all finer movements.

Headache, especially in the morning, is common. Sleeplessness and bad dreams are frequent complaints. Inability to fix the attention for long periods interferes with work. The reflexes are exaggerated and there is a general myotonic irritability.

There is a marked increased susceptibility to changes of temperature. These patients tolerate cold very badly and very few can take a cold bath. There is marked irritability of the skin vessels, and dermatographia is practically universal, one may obtain the "white" or the "red" tache depending on the degree of the local irritation. Flushing and blushing of the skin is a very annoying symptom. Even on a cold day profuse axillary perspiration may be noted. It is common to see these patients shaking from cold and perspiring profusely from the arm pits.

The dusky cyanosis of the exposed hand up to the cuff with coldness and moisture is the usual picture. There is a fairly sharp line of demarcation located just above the condyles. Below this line there is coldness and moisture, above warmth. Many of these symptoms are presumed to be vaso-motor in genesis. The recent work of Lewis throws considerable doubt on this. He says in his investigations on Raynaud's disease that the abnormal element in the reaction to cold is a direct reaction and due to a peculiar condition of the vessel wall locally, it is not the result of a reflex through the vaso-motor nerves. He believes, however, that the state of the vaso-motor nerves influences the tone of the vessels of these patients with Raynaud's disease.

PHYSICAL SIGNS

Of special interest is the examination of the heart, the organ to which most patients refer their symptoms.

The apex beat is diffuse and the pulsation over the precordium is often wave-like, and extends over 2-4 spaces. The apex beat is felt sharply and forcibly. The heart is markedly overacting. A distinct thrill is often present and has been confused with the thrill of mitral stenosis. The apex beat is felt well within the midclavicular line. Turning the patient to right or left side, the apex beat may move widely in either direction. The heart is, as a rule, of the pendulous, or dropped type.

The first heart sound is impure; it has, as Cohn has described it, "a serrated quality" that is split up into ill-defined minor parts. These serrations have caused confusion with the presystolic murmur of mitral stenosis. The second heart sound is often accentuated at the apex.

CARDIAC MURMURS

N. C. A. is the condition most frequently mistaken for mitral insufficiency. The presence of a systolic, apical murmur in about 85 per cent of the cases, is largely responsible for this. The violent heart's action with the

pronounced cardiac impulse are frequently interpreted as hypertrophy, rather than the wide swing of the pendulous heart. Of 10,000 recruits examined by the speaker, 870 of the cases presented systolic murmurs, of which 33 fulfilled the requirements for the diagnosis of mitral valvulitis; that is: (1) Cardiac hypertrophy. (2) An apical, systolic murmur (3) A definite history of rheumatic fever. Two of the three criteria were considered necessary for the diagnosis of real valvular disease.

Notwithstanding the fact that for almost half a century, the condition of "irritable heart," or N. C. A. was known, up to the beginning of the World's War as Conner puts it, it is doubtful if one physician in a thousand had ever ventured to make the diagnosis. This was shown in our earlier records of the causes of rejection of men for service. At one camp, there were two cardiovascular boards working at independent stations. Station I examined 4217 men, and rejected 144, or 3.4 per cent. Station II examined 3777 men, and rejected 118 men, or 3.1 per cent. At Station I, N. C. A. comprised 75 per cent of the total rejections, while at Station II, only 50 per cent. Station I discharged only 7 cases for mitral insufficiency, while Station II discharged 46.

The examination of such large groups of men convinced practically all observers that our previous ideas of the conventional physical signs of a normal heart are probably wrong. Variations from the presumed normal are almost the rule. These general facts are especially well illustrated in cases of N. C. A. A systolic, apical murmur is heard in about 80-90 per cent of the cases. It may be absent when the heart rate is slow, and appear with increased rate. The characteristics of the murmur may differ in no way from the murmurs heard in rheumatic, valvular disease. Its transmission to the left may be as extensive, but usually the murmur is more localized. Conner believes that 9/10 of all systolic murmurs in young adults, belong to the class of accidental, or so-called functional murmurs.

Physicians largely from habit of thought and training have learned to disregard systolic murmurs heard over the pulmonary conus; the so-called "area of romance." Systolic basic murmurs are almost as common as systolic apical ones in N. C. A.

PROGNOSIS

In general the prognosis is good. The post-infectious cases almost always recover. In patients with chronic infections such as dysentery, colitis, etc., the prognosis depends on the exciting malady.

In those cases in which constitutional asthenia predominates, the prognosis must be more guarded. There are periods of practical recovery and periods of remission. I have followed a small number of cases for 10 to 12 years. They are all leading active, useful lives, they have learned how to adjust themselves to life. A problem of practical importance is to determine the life history of a large group of these sufferers.

SUMMARY AND CONCLUSIONS

1. Neurocirculatory asthenia is not a clinical entity, but a symptom complex due to many causes.

2. It is not a disease of the heart.

3. Cardiac murmurs are present in over 80 per cent of the cases.

4. Heart murmurs do not mean heart disease.

5. Breathlessness and pain in the "heart," left chest, rarely mean heart disease in young adults. In fact, the patients with organic heart disease rarely complain of these symptoms.

6. The great lesson to be learned is that most systolic murmurs, so-called "leaky valves," "leaking heart," and "murmuring heart," do not mean heart disease, and the early recognition and proper handling of these patients

will restore the vast majority of them to usefulness and health.

The importance of a thorough appreciation of these facts cannot be too greatly estimated. Systolic apical and basic murmurs in themselves, do not indicate structural disease of the heart. "A leaking valve," as the patient puts it, does not mean heart disease.

The improper interpretation of these physical signs produces cardiophobia and increases tremendously the therapeutic problem of helping these cases.

GRAPHIC METHODS OF EXAMINATION

Orthodiography, x-ray, and fluoroscopy have contributed many interesting findings. The hearts are often small, occupying the mesial portion of the chest. The left border often extending no further to the left than the right border to the right. The heart is overacting and swings widely. All chambers can be seen to pulsate diffusely. The motion resembles a see-saw. The pulmonary conus and the auricles pulsate widely. The aorta is dynamic in its pulsation, and resembles the pulsation seen in cases with aortic insufficiency. On carefully studying such a heart's action under the fluoroscope, one is not surprised that it makes adventitious sounds. All variations from this typical picture may be seen.

Electrocardiography has given little aid from a positive point of view. The cardiograms are normal—at times the third derivation is directed downward, but becomes upright on held inspiration. This is due to the position of the heart and not to a hypertrophy of one of the ventricles. There is no electrocardiographic evidence of myocarditic involvement.

Blood pressure observations correspond to the extreme lability of the entire vascular apparatus. At rest, the systolic blood pressure is 100-130. After excitement or exertion, it may rise to 150-190, and fall in a few seconds or minutes. The diastolic pressure may be very low and

the pulse pressure high, so that the dynamic signs resemble aortic insufficiency. For example, the carotids are seen to pulsate violently—there is a pistol shot sound in the femorals, but never a true Durozier's sign.

The examination of the blood and urine shows no deviation from the normal.

DIFFERENTIAL DIAGNOSIS

The differentiation of the post-infectious type of N. C. A. from the constitutional variety is of greatest importance. It must be remembered that the constitutional type may be aggravated by acute or chronic infections. However, an individual who has always had a normal exercise tolerance and develops the syndrome after grippe, dysentery, etc., belongs to the former type. His symptoms are mainly exhaustive in type, pain is not a prominent symptom. Where no obvious infection immediately precedes the symptoms, the problem becomes more difficult. This is exemplified best in the cases which prove subsequently to be tubercular. However, watching for rise of temperature, x-ray of the chest, etc., will eventually make the differentiation. It is interesting that the response to measured exercise in the tubercular is better than in the constitutional variety of N. C. A.

The relationship of chronic focal infections is difficult to state. Chronic focal infections are present in practically all of us, and the percentage is little, if any higher in patients with N. C. A. Sinus disease, especially recurrent ethmoiditis, in my experience may be an aggravating factor. Recurrent tonsillar infections may also play a rôle, but we have no proof that simple so-called diseased tonsils are important factors.

The relationship of acute and subacute rheumatic fever is important. We now know how frequently this disease exists without the usual joint manifestations. Rheumatic myocarditis without valvular disease is probably more common than we know. In the British hospitals, a history

of A. R. F. was obtained in a higher percentage than in the American cases. This is probably due to the fact that A. R. F. is supposed to be more frequent with them. However, it is probable that some of these cases are really cases of rheumatic myocarditis and do not belong to the syndrome. The rheumatic type may show electrocardiographic changes, run temperatures, have an increased leucocytosis, a more persistent tachycardia, especially during sleep, and complain more of pain than exhaustion.

The differentiation from Graves' disease is based on the metabolic rate, on the ocular symptoms, and the differences of the types of tremor, etc. Emotional tachycardia is temporary and gives a normal exercise response. It has often been my experience in examining a patient, to find the pulse rate over 110, and upon exercising the patient, to have a drop in rate rather than a rise. This is characteristic of the emotional tachycardias.

A more difficult diagnosis is to distinguish the psychoneurotic with emotional tachycardia from the constitutional asthenic individual with a neurosis. Here we need the help of the psychiatrist. There are many borderline cases. The constitutional asthenic individual has always been so and his neurosis has been added, either in the form of cardiophobia, or some other anxiety, or exhaustion neurosis. The psychoneurotic, however, refers his symptoms somatically to his heart. The therapeutic approach to each type is obviously different.

We are greatly indebted to Sir Thomas Lewis and Sir James MacKenzie for the general principles of treatment. MacKenzie for the dictum that a heart was as good as the work it could do, and Lewis for the principle of graduated exercises as a therapeutic procedure.

In all diseased conditions the etiological factors largely determine the therapeutic measures. As neurocirculatory asthenia is not a clinical entity, each case must be thoroughly studied for causative or predisposing factors. The early cases of organic heart disease should be weeded out.

It must be remembered that patients with constitutional inferiority may develop any disease, such as acute rheumatic fever, tuberculosis, etc. The combination of neuro-circulatory asthenia and chronic valvular defects is not rare, and is a most difficult therapeutic problem. In general the post-infectious variety is the simplest to treat, it simply needs convalescent care, graduated exercises in the form of play and games, and positive assurance that they have no heart trouble, no valve leaks, no leaking hearts, etc.

The therapy of the constitutional type of neurocirculatory asthenia is a very complex and difficult problem. Early diagnosis is of extreme importance. Pediatricians and family practitioners should be especially alert and recognize this clinical picture. Structural heart disease is being diagnosed too frequently in young people. Once the patient is given the idea that he has heart disease, it is very difficult to convince him that this is not so. The patient must be convinced that he has no heart trouble. His exercise tolerance must be tested and can be improved by graduated work or games. He must be made to exercise. Overfatigue should be prevented. Gradually he can be trained by various hydrotherapeutic procedures to stand cold. He should be taught proper posture and breathing exercises. Games and sports should be encouraged. Morning setting-up exercises followed by a cold rub and then a bath or shower gets these patients going and prevents much of the dizziness and morning fatigue. The assistance and coöperation of a psychologist is important. One must gain their confidence and explain the various symptoms.

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EDITORIAL

A MEDICAL TOUR IN EUROPE

Leaving New York on the night of August 9, our objective was the meeting of the Germanic Society of History of Medicine at Buda Pest, September 5-11. Our English ship proved an uncommonly steady sailer, and with the exception of a fire which broke out in the hold, handled by the captain with the cool, collected self-possession of his race, our voyage across was as smooth and uneventful as a steamboat ride on the Potomac or the Mississippi in good weather. Arriving in port, August 19, we were domiciled in Wellbeck Street, near Harley Street and its mews, in the heart of medical London. We patrolled the entire length of Harley Street at midnight, admiring its polished dark green doorways of hard wood and the tiny lettering of so many distinguished names on the brass door-plates. In respect of the medical ethics of self-advertisement, this is the most exemplary street in the world.

LONDON

To see such a vast metropolis as the British capital in four days might be conceivably baffling or tedious. Yet through the kindness of Sir D'Arcy Power, Dr. F. G. Crookshank, Dr. Charles Singer and Mr. L. W. G. Malcolm, I was shown everything of consequence, with no particular trouble to myself and a minimum of that stupefying variant of the Erb-Goldflam symptom-complex (*myasthenia levis*) which is apt to go with perfunctory sight-seeing. Sir D'Arcy Power did the honors of the Barber Surgeon's Hall, and other remains of London's medical past, with that genial old-world courtesy which survives in him; and Kew Gardens, Richmond Hill, Hampton Court, Windsor linger in the memory as places of supreme beauty, set off by Crookshank's engaging *flair* in the fine art of conversation. At Singer's, I met Elliot Smith, just back from Java, a handsome, largely moulded man, of solid abilities and stable character, bearing no malice for such trivial accidents as mere differences of opinion. His views on Javanese music, the status of Egyptian excavations, the

teaching of anatomy, the philosophy of medical museums, proved extraordinarily stimulating. Singer showed me the Hunterian and South Kensington Museums, the illustrated medical MSS. of the Middle Ages in the British Museum, the libraries of the Royal College of Physicians and the Royal College of Surgeons, the Indian serpents in the Zoological Gardens, or whatever I may have requested; and Malcolm everything else.

On the whole, one's impression of medical London centers in a certain evocation of the past which can be elicited from its medical remains and the fine efficiency and reverent spirit with which its library and museum collections, its MSS. and other mediæval relics are preserved and kept. Here, as we shall see, London is better off than Paris. Among the most remarkable of the scientific foundations in newer London are those instituted by Dr. Henry S. Wellcome, an American naturalized in England, whose gifts to the United Kingdom bid fair to rival the philanthropies of Andrew Carnegie in America. Apart from the Tropical Research Laboratories, established at Khartoum in the Soudan (1901), the Wellcome foundations include Laboratories for Physiological Research at Langley Court, Beckenham, Kent (1894), Chemical Research in London (1896), Entomological Research in the Gardens of the Royal Horticultural Society at Wisley, Surrey (1915), a Bureau of Scientific Research (London, 1913), the Wellcome Historical Medical Museum (London, 1913), and a Museum of Medical Science and Tropical Medicine (1914); not to stress the extensive excavations he has conducted in the Upper Nile region since 1910 and his many charities in Asia and Africa. Within the Medical Department of the United States Army, Dr. Wellcome will always be held in especial esteem by reason of his annual prizes, which have done so much to encourage grappling with basic problems in medico-military administration. Of his London foundations, we were able to see but two in the limited time at our disposal, viz., the Museums of Medical Science and Medical History. The first, housed in a large building

in Endsleigh Court, is in effect, an entirely modernized extension of the fundamental idea inherent in the Hunterian Museum, viz., a teaching plant which aims to set off "mere literature" by visualizing all that is known of the pathogenesis, treatment and prevention of outstanding diseases afflicting present day humanity. Each disease is epitomized by display of objects and placarding in black and white, in a way to make the museum what Sir Walter Fletcher calls "a sumptuously illustrated text-book." Exhibits of the same educational tendency have been made on occasion by the U. S. Public Health Service, but here we have a presentation of the essential data in each case, a *multum in parvo*, which is compact, not too extensive, never wearying, and does immense credit to the director, Dr. S. H. Daukes. One gets somewhat different reactions from the Historical Medical Museum, which is directed by Dr. Wellcome himself, with Mr. L. W. G. Malcolm as his conservator. About one tenth of this extraordinary collection is housed temporarily at Wigmore Street, Cavendish Square, but most of it is still unpacked and in storehouses. This fact alone will give some idea of the zeal and enterprise of its founder in the single detail of collecting specimens. Since the tentative opening of the Museum, in connection with the International Medical Congress of London in 1913, the difficulties in the way of organization and development have been well-nigh insurmountable. There was first the long interruption of the World War and the reconstruction period in England, then the dearth of competent museum personnel, then the manifest need of a building of suitable size. Yet Wellcome has persevered bravely in pursuit of his basic ideal, to illustrate phases of evolutionary development in medicine by object teaching. Before venturing an opinion as to the essential project, it is worthwhile to cite the sympathetic appreciation of Sir Arthur Keith:

"When Buckle tells of the discoveries made by William Smith in the opening years of the nineteenth century—of how the crust of the earth was arranged in strata and that the order and age of the strata could be told by the fossils contained in them, he did not perceive that geologists had discovered a new way of writing history by deciphering things and not

words. In this new way the history of the world on which we live is now being written. It was Pitt-Rivers who demonstrated how reliable human history could be built up, bit by bit, in the shelves and show-cases of a museum. . . . What Pitt-Rivers did for human culture in general, Dr. Wellcome has sought to do for a great branch of human knowledge—all that pertains to the art and science of healing. . . . Now the evolution or history of medicine is more difficult than any other branch of knowledge to illustrate by museum methods. The trend of evolution is nearly always toward complication, . . . but in medicine it is otherwise; even amongst the most primitive races of mankind, we find that the practice of medicine is founded on an elaborate code of beliefs; these beliefs are the fine-drawn gossamer of savage fancy—altogether too delicate threads for the clumsy fingers of museum curators to touch. . . . Our difficulties begin when we seek to portray how the native practitioner looks upon the human body when it is well and when it is ill. Until we have surmounted this difficulty we cannot appreciate the riches which are shown in Mr. Wellcome's "Hall of Primitive Medicine." . . . In that Hall you will find a wealth of amulets, charms, talismans, mascots, phylacteries, totems, fetishes, divination bowls, effigies, idols, masks and ceremonial dresses. When you examine the contents of that room you are really surveying a massed field of therapeutic artillery—the batteries by which ancient physicians sought to banish illness and disease from their patients, thus staving off death. The counterparts of the native artillery in Harley Street are the stethoscope, the bismuth meal, notebook for prescription and a certain professional air."

These sentences convey, without irony, what Dr. Wellcome is after, what he has thus far accomplished and the pitfalls which lie in wait for him. The exhibit of primitive medicine is as above described, there are rows of objects illustrating the "evolution" of surgical instruments, of spectacles, of the obstetric forceps, there is a gallery of medical portraits, a collection of Jenner memorials, a reproduction of Lister's original Glasgow ward, an alchemist's laboratory of the 16th century, a barber surgeon's shop and a series of Chinese, Turkish, Italian and English apothecary shops of different periods; but the objects are so crowded in the small space available that interest is apt to be distracted and attention wearied by the profusion of exhibits in a single case. The obvious desideratum is a larger building in the medical quarter of London; but with the great object lessons of the Warburg Library (Hamburg) and the Germanic Museum (Munich) fresh in mind, it may be seriously doubted if the essential themes

of medical history (as a phase of the history of ideas) can be taught in any museum, even the very best conceivable.

One may even doubt Keith's dictum that "museum-making and history-writing are the same thing," for even Sudhoff's great catalogue of the Dresden Hygienic Exhibit of 1911 makes no such pretensions. What the museum man does, in effect, is to display the crude symbolism or materialism behind primitive modes of thought, to stake out lines of approach and attack upon difficult problems and to visualize isolated bits of achievement. In primitive medicine and the history of hygiene, some of these exhibits may be more eloquent and informing than the printed page; but it is plainly impossible to elucidate the medicine of classical antiquity, of the Middle Ages, of the Renaissance and successive periods by any such method. As in the collections in the Josephinum (Vienna), there is a distinct disadvantage in exhibiting too many objects at one and the same time. The smaller and more select the collection, the better will it illustrate medicine in relation to the history of ideas. In this regard, the historical exhibits made by the late Admiral Flint in the National Museum or by Majors Callender and Ash in the Army Medical Museum at Washington, albeit insignificant in size, have considerable teaching value. When the Wellcome Museum is fully developed, in a *milièu* of sufficient magnitude it will undoubtedly be the most astounding collection of medico-historical treasures in existence. What is set down here, is stated frankly as honest opinion, without reference to the esteem one has for the founder of the London collections. There is no finer, more modest gentleman living than Henry S. Wellcome and none more deserving of any honor that might be accorded him by the British or the American nation. To him, the British Empire, in particular, owes much, and one was painfully surprised that he should be subjected to any criticism whatever. We are privileged to quote his own statement (from a private letter):

My only apprehension in regard to criticism of this Museum in its present unfinished state, is that through misunderstanding of my methods, intentions and purposes, it might be thought that I regard the Museum as *now* being perfect and complete; while as a matter of fact it is merely in its infancy and still at an early stage of organization.

For many years, I devoted as much time as I could spare from my other activities to collecting material for a projected Historical Medical Museum and Library, to be founded at some propitious time in the future.

In 1913, when the International Medical Congress was held in London, it was proposed to form an Historical Section. The chief Officials of the Congress, and other eminent men interested in medical history who had encouraged and assisted me in my project, insistently appealed to me to make selections from my collections and to organize a temporary Museum as a centre of the Historical Section of the Congress.

This was long before it was possible for me to begin proper detail study and classification of my extensive collections of material, and many years before I anticipated the provision of a suitable building, and the founding of my projected Museum.

I responded to the appeal and hastily secured the present temporary premises and equipped them for the occasion.

However, so much interest was manifested in the collections during the Medical Congress, that at its close I was prevailed upon (contrary to my own inclinations and settled plans) to keep the Museum open, permanently. Then I secured a lease of the present inadequate buildings. Soon after, the Great War followed and wiped out my trained and experienced staff. The aftermath of war continued to paralyse my efforts to secure adequate qualified staff and a suitable building in which to carry out my plans and ideas. It is only quite recently that I have secured the services of a group of qualified assistants whose time is devoted almost exclusively to studying, working up and classifying the material of certain sections. This work is necessarily slow and cannot be rushed. Some members of this technical staff are working in the Museum and others at the storehouses.

Greatly to my regret, plans for the development of the Museum and Library have been thwarted by unfortunate difficulties. Sometimes I have wished that I had persisted in my original intention to postpone the opening of the Museum until the collections could be properly and completely studied, classified and catalogued, which plan I have rigidly pursued in respect to the Library.

However, the Museum is now in a state of evolution, and my plans are being gradually developed in accordance with my original ideas and intentions for constant progress on scientific lines. I anticipate that it will in the course of time attain to the high ideals to which I aspire.

COPENHAGEN

The little packet-boat, which propelled us across the North Sea from Harwich to Essjburg, is the rightest, tightest, smartest little craft we have yet the good fortune to sail upon. It was beautifully decorated within by a dark polished hard wood finish of unusual lustre and the profuse lay-out of Scandinavian *højs d'aurres* on the dining room tables was equally cheering to the eye. In the tiny salon was an excellent piano upon which I strummed a few vagrant tunes, when a pretty Danish girl, of unusual type, appeared, and played for me the national melodies of Denmark, explaining them, as she went along, with a perfect English accent. Essjburg was reached in a driving rain and a night walk through its streets demonstrated, if nothing else, that the passing of the Nordic in Nordic latitudes is piffle. The Mitropa sleeper, which had the same sumptuous appointments and brilliant hard wood finish noted in the North Sea steamer, reached the Danish capital on Sunday morning.

Copenhagen is one of the most beautiful, charming and viable of all the European cities. Not as yet spoiled by over-expansion and motor traffic, you can wander through its attractive streets in any direction and always come back somehow to the central square, as in the delightful towns of old. Strolling down the Gothersgade after breakfast, for instance, you come in succession to the Royal Gardens, the Rosenburg Castle, the Botanical Gardens and the huge Communal Hospital. Here we inquired in vain for sundry Danish medical historians, but were mercifully spared the inevitable invitation to "see the hospital," in the sense of futile tramping through lengthy wards and corridors, now pretty much the same anywhere. Around the corner is the Art Museum, which contains a few, medical items, with some stunning bits of sculpture, suggesting that native talent for the plastic did not die out with Thorwaldsen. Among the statues outside was a wrestler by Gauguin, of no outstanding merit beyond the indication of corpulence and a faint demonstration of the *cremaster*

reflex. The Royal Library, like several other European libraries, is "under the shadow of swords." The fine building is situated in a pretty Hampton Court Garden invested by the *Tojhaus* (arsenal), but the Moschion Codex and other MS. treasures were not accessible on Sunday afternoon.

STOCKHOLM

Passage across the Baltic to Malmö was effected on an ordinary large sized ferry, of the type familiar to New Yorkers; and the ride across Sweden by rail was, to our sense, Minnesota over again—the same landscape, the same red barns, the same types of dwelling houses, made by the same people. Stockholm, one of the finest cities of the north, was a-bustle with the noise and dust of motor traffic in its busier streets, so much so that the tense, grave, annoyed expression of passers by, an otherwise sturdy, stolid, well-set-up people, seemed actually to derive, as in all such cases, from the dust, the wind, the jarring clang of the motor tram and the noise of vehicles over the cobble-stone pavements. The same self-contained people were moved to tears at a Swedish opera, based upon that earlier section of the Gösta Berling saga (Selma Lagerlöf) in which the great army lady and industrial magnate rescues the demoralized, unfrocked clergyman, freezing to death in the snow, and turns him into an outstanding figure of a man through a rugged appeal to his manhood. The men and women of Sweden are physically handsome to a degree, the Nordic *in excelsis*, but their faces in the streets have the set, determined expression of a people used to coping with hard, bitter winters. The Royal Art Gallery, which contains the Breda Withering and a fine exhibit of the school of etchers deriving from Zorn, the magnificent tapestries and embroideries of barbaric pattern, the decorations in the churches, the appointments in the hotels, the *Skansen* or national dances, all these afford so many interesting sidelights upon the essential note of Swedish civilization—French elegance and charm, derivable in part from the Bernadotte tradition, superimposed upon a rugged, Nordic

background—the sort of thing that Friedrich cultivated in the accessories of Potsdam. Of medical libraries, there is an excellent one in the domicile of the Svenska Läkäresällskapet; but the medico-historical treasures in the Royal Library, such as the queer, bisected, Janus-faced specimens of the *Fünfbilderserie*, which Sudhoff found there, are buried in it, as in the libraries of the British Museum or Leipzig University. Through the courtesy of Dr. Carl Efvergren, the assistant librarian, we were able to see in detail this splendid collection, the arrangement and administration of which are of ultra-modern type.

GERMANY

We entered Germany by the island of Rügen, and the first thing we encountered was a roguish twinkle in the eyes of the customs official, as he put the usual questions: *Tabak? Alcohol?* A few minutes later, we were drinking some of the best Pilsener to be had in Germany, made at Donaueschingen, at the very sources of the Danube, where Sudhoff made one of his best finds in the way of MS. anatomical drawings of the Middle Ages. This auspicious beginning augured well for a journey which, we had been led to believe, would be a matter of sour looks, repelling manners and general intransigence. As a matter of fact, our progress, from the ferry crossing at Rügen up to the moment when we waved adieux from the train to our hospitable friends at Munich, was an uninterrupted succession of pleasurable incidents, courteous, impersonal, fair dealing at the hands of those in authority, and, on our own side, of unqualified respect for the manly, upstanding way in which the German men have weathered the fortunes of war, of renewed admiration for women, who, in the face of privation and poverty, have chosen to remain women, in the sense of being friends of man rather than competitors within his citadel. As the train proceeded from Rügen to Hamburg, pretty girls began to blossom by the wayside like daisies in a meadow, and in Hamburg we encountered a *Schalk*, who accurately diagnosed the dour-faced kill-joy

by my side: "You smoke too much pipe, mister." Revisiting Germany after a lapse of twenty years, one finds no shadow of turning from the paradigms of the Italian anthropologist: *bionda e cerulea e bianca; fatta piu per le lunghe tenerezze che per gli incendi subitanei, organizzata in modo d'essere miglior moglie che amante; piu donna che femina; piu vicina all' uomo che non molto altre sue sorelle d'Europa*—the maternal type, "nearer to man than all the rest of her European sisters;" so near, in fact, that even a little girl, a gentle maid in her teens, tried to mother me. One sensed the wings of the dove, as if momentarily promoted from our place among the *chthonioi* into the realm of the *beati sunt*.

HAMBURG

Our mission in Hamburg was to visit the Warburg Library, which is situated in one of the most attractive suburbs, and was founded in 1902, as a collection of books and pictures centering upon investigation of the influence of the antique upon the Italian Renaissance. It was expanded later to cover the effect of the same influence upon the post-antique cultures of the Orient and the Occident. Latterly, the lines of investigation have converged upon scientific iconology, *i.e.*, the function of symbolism in the total development of humanity. Although strangers, we were most courteously received by Dr. Warburg in his waiting room, decorated by a copy of Whistler's portrait of Carlyle and a photograph of Charles Elliot Norton, whom he regards as a solitary outpost of advanced culture in the New World. The library, confined to the science of religions and the history of art, numbers some 50,000 volumes, classified and arranged with relation to the fundamental idea which activates the library. This, Dr. Warburg expounded about as follows: In the earlier or primitive stages of human culture, an idea is always conceived *ab initio* as a thing or a symbol of a thing, This science converts, by abstraction, into an idea, which is then reconverted into a concrete entity by applied science. Thus, the

planets were initially conceived as living, sentient beings or material things by ancient astrologers; they were then studied mathematically by astronomers and eventually recognized as concrete things, having physical and chemical properties, by astrophysicists. An apotropaic scarab of Egypt symbolizes the warding off or prevention of disease, by averting its demons, which we conceive, by ideation, as altered physiological states of the body and proceed to treat or prevent by opposing the concrete things at the back of them (bacteria, parasites, chemical states of substance) by very material warfare of chemical or physical nature. The Library has already issued a remarkable series of publications, printed by Teubner, illustrating this trend of thought in astrology, which is basic for the study of pre-Hellenic and mediæval medicine.

LEIPZIG

At Leipzig, we were shown the famous Institute for the History of Medicine by its Director, Professor Sigerist, a man of great personal charm and broad culture, who has gathered around him a most engaging group of loyal and capable young pupils. The Institute is housed in a suite of rooms in the Mathematical-Physical Institute, one of the University buildings, at the corner of Leipzigstrasse and Talstrasse, forming an attractive studio for research work in medical history. Considerable rearrangement has been effected since Sudhoff's time. Many of the glass case exhibits have been removed, probably by reason of the growth of the library, which now occupies a separate room, and is probably one of the best working collections of its kind in Europe. The advantage of reducing the number of show-case (vitrine) exhibits in a place devoted to teaching and investigation is that, as already stated, too profuse and too miscellaneous a collection of such objects is apt to distract and divert attention from things of more moment. The total number of objects which might conceivably illustrate medical symbolism and medical ideation is, in all probability, not more than 30-50 at most. All

this would seem to be along the line of departure taken by the Leipzig school with regard to modes of investigation. The trend of Sudhoff's teaching, with reference to his own work and the problems assigned to his students, was factual and archivistic—to ascertain data and dates beyond peradventure, to edit and publish MSS. or other unprinted material, as *Bausteine* for future syntheses. The trend of Sigerist, who early made his mark by work upon Swiss archival material, is philosophic, analytic, ideational, the tendency of the Warburg foundation. It is illustrated by such recent contributions of the Leipzig school as those of Dr. Ernst Hirschfeld on romanticism in German medicine or his keen analysis of Virchow, Wolfram Illing on the concept "neuroses" in French medicine of the 19th century, or of Sigerist himself on changes in the ideals of physicians. This philosophizing tendency has become very general in German medicine of late, notably in the historic *opus magnum* of August Bier. It is said to be due to lack of funds for laboratory investigation and general research work. To discover and investigate unknown or unprinted archives, in out of the way places, requires such a travel-fund as Sudhoff had; to make such archæologic excavations as Wellcome is forwarding requires his financial resources. The philosophic trend is thus a natural outcome of initial conditions, and will doubtless spend itself as conditions improve. Its only danger is that it is based upon ratiocination with reference to ideas rather than rigorous deduction from facts, and so tends to diffuseness and sometimes to reasoning from false premises. On the other hand, conclusions and syntheses from factual or archivistic data are apt to be premature, ill-considered, beyond the middle distance of the picture, unless all the data are known in advance. What seemed most attractive about the Leipzig school was the character and quality of the pupils, whom Sigerist fathers with genial *cameraderie*, taking them into all the pleasures of his own life—a pleasant, friendly group of boys and girls, some of them very learned, yet addicts of dancing, swimming and walking tours, and all of them very attractive young ladies and gentlemen.

BUDA PEST

The best way to enter this magnificent city is down the Danube from Passau, between which and Vienna are such picturesque places as Linz, Grein, Melk, Schönbühel, Schwallenbach and Dürnstein. Boarding the little vessel at Vienna, we found on deck Professors Sigerist, Sticker, Drs. Darmstaedter, Ferckel, Hirschberg, Marzell and others, with our jolly little band of Leipzig students. The voyage downstream from Vienna was less eventful than the Passau-Vienna journey, for the most part, indeed, like the passage of an ordinary small sized American river; but we stopped at Pressburg (Bratislava), where the Hungarian kings were crowned, Gran, surmounted by the imposing cathedral for which Liszt composed his loveliest mass (*Graner Messe*), and the fortress of Visegrad, associated in our minds with an album of piano pieces by Robert Volkmann. Buda Pest, seen from the river by night, is a gorgeous spectacle, surpassed only by the great mountainside of Hong Kong, which, illuminated, is the most delectable column of light in the world. At the foot of the lofty Blocksberg, apparently lighted up for our benefit, lies the St. Gellert Hotel, where after a cordial greeting from Sudhoff, we were domiciled. At a *Kneipe* later on in the evening, we met Diepgen, Haberling, von Brunn and many others whom we had known hitherto by their historical writings only. Around the *Stammtisch*, Sudhoff was soon in his element, astonishingly witty and vivacious for his years, with suggestions of Bardeleben, Billroth and Brahm in his countenance, a being of quaint ways and gusty humors, breaking out into the *Kasernenstimme* with a merry twinkle, a man who knows how to play with children or to play like a child himself, and, by the same token genial, cordial and charming *au fond*. His vocabulary is astounding, for, like Aristophanes, he compounds new words as he goes along and his syntax, so peculiarly his own, is at whiles intelligible only to his intimates. German in fact, is spoken by the Germans of to-day at an amazingly rapid tempo, but with a little practice and some familiarity

with *nuances*, one is at length oriented. A master of clean-cut phrasing and unmistakable clarity of expression is Paul Diepgen, only just called to the chair of medical history in Berlin, a Toledo blade of trenchant concision and incision, hard-boiled and hard-headed in his dealings, a bit cocksure in his views about America no doubt, but so polished, witty and well-poised withal, that his conversation was a perpetual stimulus to thought. Of quieter mentality and mien is Sticker, one of Germany's most eminent scholars, whose sober, serious *allure* is an index of that unfailing surety and security in methods and results which is the portion of the contemplative mind. Our most jovial and amusing companions were Haberling and von Brunn, sometime medical officers in the German Army, imbued, both of them, with the cheerful, laughter-loving spirit of the most attractive type of soldier, contagious, ringing laughter, expressive of the *nempe fortitudo* and somehow suggesting the life-enhancing chords at the end of Siegfried. Remarkable friends these, who took possession of us at once, were never up-stage or stand-offish, and greeted us each morning with a pleasant smile. With these preliminaries, we may now approach the Buda Pest meeting itself.

With the exception of the London Congress of 1913, which Osler made so successful, medico-historical meetings are apt to be *peu de chose*. That at Buda Pest was notable for a series of papers which were all of them carefully and elegantly written and some of them most interesting. Outstanding were, of course, the contributions of Sudhoff on Toledo and its medical MSS., Sigerist on the changes in physician's ideals, Sticker on the epidemiology of bubonic plague in Hungary, Diepgen on the earlier history of medico-historical studies, Darmstaedter on the Archidoxæ of Paracelsus, and a new life of Hippocrates from an old codex, discovered by Dr. I. Fisher of Vienna; but papers of unusual merit were presented by some of the younger men, notably those of Englert on the early history of the doctrine of qualities and humors, Hirschfeld on the romantic

period of German and European medicine, d'Irsay on the historic relations of medicine to the university, Marzell on mediæval pictures of the mandragora plant, Reinhold Müller on medicine in the Rig Veda and Temkin on Celsus. Frau Haberling, a jolly, rugged soldier's wife, presented a fascinating series of lantern slides illustrating the first glimpses of midwifery (organisation of the puerperium) in pictures from religious MSS. of the Middle Ages showing Joseph and Mary with the infant Christ. Of the younger pupils of the Leipzig school, Englert is the most learned Grecian, Hirschfeld the most acute and well-informed, Temkin the most serious and independent in aims. Dr. Reinhold Müller, a *privat docent* of Einsiedeln, stands quite apart as a protagonist of the new lines of approach and attack on the puzzling welter of ancient Indian medicine, which Singer has so aptly described as a "weary waste." The extraordinary findings of Le Coq and Grünwedel as to evidences of Hellenistic culture in Central Asia (Chinese Turkestan) before Alexander, and those of Hertel and Laufer on Indo-Iranic and Sino-Iranic sources, have given us an entirely new slant on this difficult problem. It was a genuine pleasure to converse with Dr. Müller on these questions and judging from his capacity to convey his remarkable learning in such a simple, lucid manner, one may venture, with confidence, to predict an interesting future for him. His published contributions are of unusual depth and merit, and he himself is a most likeable Teuton of the good old-fashioned rugged mould, upstanding, unpretentious, inflexibly honest and absolutely sincere.

Through the good offices of Dr. Tiberius von Györy, leading medical historian of Buda Pest, the entertainments and courtesies extended by the Hungarian government were of the most lavish character, lasting over eight days and including visits to the state buildings, the Roman excavations at Aquincum, the bathing resort at Balatonfüred, the new Medical Institute and clinics at Debreczen, a dedication of the Semmelweis monument (Elizabethplatz) by Sudhoff, two festal dinners given by the Hungarian gov-

ernment and the city of Buda Pest, and a joyous demonstration of the effects of different vintages of Tokay in the great national wine-cellars at Budafok. One regretted only the contretemps whereby the nice boys and girls of the Leipzig Institute were housed in the horrid Collegium medicum, and were thus driven (bless their hearts!) to sit out the greater part of the night in cafés to evade the alternative of becoming *Wanzenfutter*. Yet, so sturdy is the Germanic stock that they were up and about, bright and early each morning, to participate in the events of the day, making light of their troubles and sporting in the *Wellenbad* as gay and cheerful companions. It was somewhat of a "jolt" to a tired elderly American to be confronted by a handsome girl with the proposition: "*Willst du mit mir wuschen?*" We compromised collectively by being photographed in ring formation as "alligators."

VIENNA

To all outward seeming, the *Kaiserstadt*, once the capital of the Holy Roman Empire, has risen gloriously out of the precarious position in which it found itself at the end of the war. By the hard conditions imposed upon it by the Paris Treaty, Austria was reduced to Vienna itself and the narrow ring of farmlands investing it, an arrangement which made it wholly impossible to feed the immense Viennese population from such a diminutive granary or commissariat. The only possible result was dire poverty, the utter abjection of all cultivated, refined, noble or decent people by subjection to the harsh extortions of greedy, fleecing profiteers, and an enormous increase of prostitution, even among women to whom such an economic adjustment was otherwise unthinkable. The reactions of the starving Viennese were none the less brave, hopeful, devoid of specific whine, and may be sensed, perhaps, in Godowski's *Alt Wien* ("smiling through tears") or their own invocation (*Gott wird für uns sorgen*). One rejoices, then, that this imperial city, with its gorgeous window-dressing, wears a smiling front, is "game," is thoroughbred, whatever of sorrow and sadness it may conceal within.

Our objective in Vienna was the Josephinum, where Professor Neuburger was to lecture to the personnel of the Leipzig Institute on the Vienna School, old and new. As the veteran teacher of medical history in Europe, albeit younger in years than Sudhoff, Professor Neuburger has weathered his troubles well, is genial, amiable, patient, sympathetic and, in every sense of the word, an accomplished gentleman. His lecture was informing and thoroughgoing, interspersed with many amusing anecdotes and pleasant reminiscences, and setting forth the immense resources of his Museum, made up largely of relics of the great Vienna tradition and otherwise admirably adapted for instruction in the history of modern medicine. With a group of undergraduate students, for instance, one might easily utilize such a collection as a *point d'appui* for working backwards from the Vienna of Billroth's time to the earlier periods, and thence to ancient and pre-Hellenic medicine. The lecture was really a démonstration through the several rooms of the Institute. At the close, we had to rush to Cook's for tickets on the Munich sleeper. At the invitation of Professor Sigerist, we dined delightfully with the Leipzig group at a mountainside hotel overlooking Vienna, winding up at Grinzing, where Schubert once composed some of his most charming songs to discharge a beer-score. Our transit to the station by auto was accomplished at a furious pace, and waving from our compartment in the sleeper, we bade our Leipzig friends good-bye for the last time.

MUNICH

Apart from the art collections, the great show-place of Munich is the Deutsches Museum, now moved from its old quarters in the Maximilianstrasse to occupy a structure of vast extent. To this we repaired on a Sunday morning, in company with our courteous guide, Dr. Ludwig Englert, who showed us through the immense subterranean mines and then (what I was really after) the exhibits illustrating the history of public hygiene, viz., heating, lighting, ventilation, food-supply, sewage-disposal and water-supply.

These are immensely instructive and so ordered that, in passing through the spacious rooms, the eye is never distracted by that profusion of objects with which most museums are cluttered up, but rather arrested by unique exhibits, each of which is conspicuous as a milestone or *résumé* of progress. In beautiful sense of arrangement, in unique *flair* for what is really important, there is no better object-lesson in the world than the Germanic Museum. A long row of actual flames, for instance, illustrates the evolution of lighting from torch and tallow dip to Welsbach burner and Mazda lamp; while huge cross-sections show just how the population of a large city obtains its water-supply from soil and surface waters, just how central-heating is accomplished, just how the wastes of a large city are disposed from house *viâ* purification plant to farm. Visualization of this kind does for the mind's eye what hundreds of tedious pages could never accomplish, the kind of thing that, in Swinburne's phrase, "makes incision in the memory." Sight-seeing over, we were given three memorable glimpses of the social and private life of Munich by those learned antiquarians, Täuber and Weil, who lunched us at a famous outdoor café, by Dr. Englert, who gave us tea in his elegant rooms overlooking the Isar, and by Dr. Darmstaedter, the learned historian of alchemy, who dined us in sumptuous state in his apartment, after showing us his wonderful library. And again, as we took the sleeper for Strasbourg, most of these friends were on hand at the depot, after the Germanic habit, to wave us farewell.

STRASBOURG

We arrived in Strasbourg on a raw, cold, "distinctly dank" morning, suggesting the harsh climatic changes of our Eastern seaboard states. Our mission was to visit my friend Dr. Ernest Wickersheimer, Librarian of the University and Municipal Library, whose wife (an American lady) I had already met in Washington. We found Dr. Wickersheimer readily accessible in his sanctum and immediately embarked upon a friendly discussion, which was

prolonged up to the moment of leaving for his hospitable home at Schiltigheim, for luncheon. Dr. Wickersheimer, a pupil of Sudhoff, is easily the ablest living medical historian of France, a worthy continuator of the traditions of Daremberg and Chéreau; yet through the queer bureaucratic fluke whereby a possible candidate for a French university position has to be conditioned in subjects having no relation to his own, he has been excluded from the chair in the Paris Faculty, and *quâ* historian, can function only through his published writings. This condition he has accepted cheerfully and manfully; but as there is no provision for medico-historical teaching in the Strasbourg Faculty, it involves him in a curious isolation which awakened a vague feeling of sadness. As a bibliographer, palæographer and cataloguer of mediæval MSS., Wickersheimer is one of the most competent and efficient of living librarians, a handsome man, of virile personality and fine essential courtesy, with definite capacity to shine as a teacher latent, no doubt, within him. But no worthwhile man can function at half-power, with capacities for development under arrest, and feel entirely happy. With the delightful indifference of the childless married man who has remained something of a bachelor, Wickersheimer seemed more interested in the status of the Berlin and Baltimore chairs than in anything concerning himself. Our only ground of contention lay in certain intellectual problems, and after he had shown us the great Strasbourg Cathedral, that wonderful evocation of the Middle Ages, I parted from this esteemed and honored friend with a distinct feeling of regret.

PARIS

It takes some time to get the genuine feel of Paris. It was in the beautiful gardens of the Luxembourg, on the fifth and last day of our visit, that I first acquired that peculiar sense of a pulsating center of social life in which this city surpasses all others. Too much time was expended in perfunctory sight-seeing, too little in studying the people themselves, in participating in their simple pleasures.

There is nothing quite like the tempo of Parisian intelligence, with which even a poverty-stricken hotel chambermaid is apt to be better endowed than most. If privation so sharpens the mental faculties that assistants in the Pasteur Institute or the Library of the Paris Medical Faculty manage to be "content with little" and *faire des économies* on a beggar's pittance, consider our sensations on seeing the rows of people seated at little tables with their packages of food, in the enclosures outside the Théâtre Française, waiting patiently all day long for a cheap ticket to the night performance. These d'Irsay pointed out as evidence of the superb pluck with which the French intelligentsia have maintained their culture since the war. An American *pur sang* would forego a thousand such performances rather than put up with a fraction of the discomfort involved, yet possesses a marvellous capacity for sitting out movies made for morons, with no apparent sign of *s'ennuyer*. A few conversations with Made-moiselle Droz, that plucky little publisher of ancient medical texts in a dismal quarter of Paris, brought out another phase. As in Henry James's "Ambassadors," one aspect of a subject had been very obviously presented to her in advance, yet at table she speedily apprehended the other, which was, in truth, as self evident and as commonplace as the existence of a bachelor uncle or a maiden aunt. Paris, then, in women at least, develops the intelligence up to the point of making them highly civilized human beings; while one is perpetually delighted with the polite *air narquois* of the men, who see into things and people, yet give no sign, beyond the possible implication that what is commonplace and obvious is never discussed. Intelligence, such as this, can never be the portion of Mencken's "beauty-hating races." To the Parisians, conversation is a fine art and France remains, as Heine and Emerson found it, "the land of intelligence."

Visits to the Luxembourg, the Museum of the Paris Mint, the Louvre, could evoke but one sensation: "*La beauté est la seule chose qui n'existe qu' à demie.*" Visits

to the Musée Carnavalet (Mme de Sevigné's old house) or the domicile of the Paris Medical Faculty awakened quite another—a feeling of stupefaction that the great monuments of French history and medicine should be permitted to languish in such forlorn condition through the apparent parsimony of government. On a dim, mournful afternoon, *triste* and momentous as the sombre finale of Chopin's F minor Ballade, I was politely escorted, after luncheon with d' Irsay at the Foyer Médical, to the Library of the great Paris Medical Faculty by Mr. Gregg, of the Rockefeller Foundations; and there, M. Cornillot, the learned sub-librarian, told us with grave, sad modesty, of its fallen fortunes; how it can no longer subscribe to foreign medical journals through lack of funds and how his assistants have to eke out a living on salaries of \$200-\$300 a year. At the end of this interview, in the halls where much of modern medicine was actually made, I felt so weary that I resolved to see no more.

Envoy.

In the decade following the World War, Europe has learned much, and if its future belongs (as it should) to the younger generation, it must surely be borne in upon them that another conflict of such magnitude will spell the destruction of what still remains of the great European civilization. Here, Spengler's Decline of the West becomes of paramount importance. In vast chapters, interwoven like counterpoint, he predicts that it has still some 400 years of good running but that its doom is foreordained and ascertained—an apocalyptic line of thought like that of the Danish poet, Paludan-Müller. A common feeling is that there can be no ultimate reorganisation and rejuvenation of European society until the present generation of talkative oldsters and Bobadils everywhere has had "the good taste to die." There are no people who have such extraordinary capacity for geniality, for creating the sensation of joy of life out of the most rudimentary materials, as the Germans in Germany. In this regard, they remind

us of Edith Wyatt's account of the German girl—born to be happy herself and to make everyone else happy. Yet, at the beginning of the war, with a superb opportunity to maintain the peace of Europe by sheer strength of hand, Germany, like the old South, made the serious mistake of ignoring Bismarck's warning that it is fatal to challenge fate—

"Fordre nicht, Du hast zu geben!
Ungeschehn ist unverloren;
Noch ruht Sieg in Deiner Hand."

To-day General Hindenburg has shown that a great soldier can also be a great statesman in the maintenance of peace, that "the main thing for a soldier is to be silent and the least of his virtues never to complain." The younger people of Germany are in process of becoming true citizens of the world, with a lively interest in their new birth-right, the *res publica*, with that serious devotion to the things of the mind which has ever been the abiding portion of their race, with a dignified concept of their proper position as individualized units in their country's welfare. As a race can rise no higher than its women, an old U. S. consul once predicted, in my hearing, an immense future for the women of Germany; and there are already signs that the part they will play is not inconsiderable. Out of the poverty and privation of the post-bellum period, Germany is beginning to evolve, in sufficient numbers, a special variant of the type lauded by poets, from Andromache in the Iliad and Nausikaa in the Odyssey to Charles Lamb's Hester—what to a *bona fide* American is, in fact, the pearl and fine flower of creation—"the dainty little maiden with the twinkle in her eye." Her dewy morning freshness is unassailably her own; her personal charm unfailing, She has arrived. *Elle prie pour nous.*

F. H. GARRISON.

OPPORTUNITIES WHICH NEW YORK CITY OFFERS FOR POSTGRADUATE MEDICAL STUDY*

FREDERICK P. REYNOLDS

"The distinction of being the first place in America to give systematic instruction to graduates in medicine belongs to New York City."

As early as 1809 the New York Hospital opened its wards to graduate students. In 1822 the New York Eye and Ear Infirmary reported having given instruction to 28 students. There seems to be no record of additional opportunities offered for the next thirty years, but at that time the New York Ophthalmic Hospital undertook a definite plan of instruction and in 1853 held organized courses in diseases of the eye. In 1873 the Metropolitan Throat Hospital first established in America upon a regular basis the instruction of medical graduates in the science of rhinolaryngology. Early in 1877 courses in diseases of the skin were in operation at the DeMilt Dispensary. Two years earlier a postgraduate department was established in New York University Medical College. This faculty in 1882 resigned from the medical college, and after an unsuccessful effort to effect an affiliation with some other university determined to establish in the city a school solely for postgraduate instruction. The group adopted the name of the New York Post-Graduate Medical School. At about the same time the New York Polyclinic Medical School—which for several years had been a skeleton organization—was opened. Thus for nearly 50 years these two schools have been in existence. They have long been known as the largest and most important postgraduate medical schools in America.

Further development was slow until the early part of the twentieth century, but "more and more the idea impressed itself upon those who gave the matter thought that the rich opportunities for graduates in medicine afforded

* Presented at the Second Congress of the Pan American Medical Association, Panama, February 1, 1930.

by the many hospitals in the city should be made known to the profession at large." Finally there came about an important event in our story, the organization in December, 1912, of the "Society for the Advancement of Clinical Study in New York." This Society first undertook to establish a Bureau of Clinical Information in The New York Academy of Medicine. A little later it produced a booklet of the fixed clinics in hospitals where visitors were welcomed, and at the same time it began to publish a daily bulletin of surgical clinics. Five years later it organized a series of medical clinics which were given weekly, and announced them in a separate bulletin. The Society's work was carried on until 1924, when it transferred its activities to The New York Academy of Medicine.

In 1919 a still more ambitious attempt was made to advance the cause of postgraduate medical education in New York by the organization of the "New York Association for Medical Education." During the following few years the Association got out several bulletins which set forth in some detail the opportunities for graduate instruction offered in New York. It also made a study of the requirements for the training of specialists, and published outlines of a number of courses leading to specialization in the clinical branches. In 1924 this Association concluded its activities as a separate organization so as to merge with the "Society for the Advancement of Clinical Study in New York" to form the "Committee on Medical Education of The New York Academy of Medicine."

The information and quotations in this brief account of the beginning and early development of postgraduate medical education in New York are taken from the interesting paper of Dr. Thomas J. Harris which was published in the "Bulletin of the New York Academy of Medicine" for August, 1928.

THE ACTIVITIES OF THE ACADEMY OF MEDICINE

During the six years in which the new Committee has been in existence it has been active in carrying on the

work of the two organizations just mentioned, and in addition has interested itself in a number of undertakings looking toward the better organization of the resources of the city in extending and developing postgraduate medical study and in improving the practice of medicine. For some time the Committee has had charge of the arrangement of Academy programs for meetings and lectures, including the Graduate Fortnight, and of the publication of the monthly Bulletin of the Academy.

The Committee feels that its work has been a useful one. Two recent commendations might be mentioned. In an editorial notice which appeared in the *Journal of the American Medical Association* regarding the publication of a booklet prepared by the Committee it was stated: "In no other city in this country have the facilities for graduate instruction been so well organized, or the hospitals and clinics so carefully catalogued. The larger cities of this country, with their many well conducted hospitals and dispensaries, provide a great abundance of excellent clinical material which, if properly organized either through some such central committee or through university graduate medical schools, could be utilized in the higher education and training of physicians. Such organization for graduate medical instruction now constitutes one of the greatest needs in medical education in this country." A recent visitor to the Bureau of Clinical Information stated that it had been his custom to spend some time each year for the past 26 years in postgraduate study, and in doing so he had visited the important medical centers of this country and Europe. He volunteered the opinion that New York offers to the visiting medical man more than any other city that he has visited and that the opportunities for work here are better arranged and co-ordinated.

A year ago at the meeting in Havana I had the privilege of presenting to this Association an invitation from the Academy of Medicine. May I take the liberty of repeating it at this time.

"THE NEW YORK ACADEMY OF MEDICINE desires to extend a welcome to all members of the medical profession who may visit New York. It offers its facilities in the hope that they may be helpful in making the visitors' stay both pleasant and profitable.

"THE LIBRARY (open from 9 A. M. to 10:30 P. M.) is one of the largest of its kind in the United States. It contains upwards of 140,000 books and theses and over 100,000 pamphlets, which are fully catalogued. Its files of American and foreign periodicals are very complete. There is a bibliographical and photostat service available for visitors at the usual library rates.

"MEETINGS. Besides two stated meetings of the Academy held each month, there are monthly meetings of the twelve different groups of Fellows organized into sections devoted to various branches of medicine and surgery and to historical and cultural medicine. In addition to these meetings, many medical societies of the city hold their meetings at the Academy. There are usually one or more meetings held at the Academy each night of the month except Sundays and holidays.

"LECTURES. A series of afternoon lectures on subjects of special interest to the practitioner is given each year, beginning in November. Lectures on public health and other subjects of current medical interest are frequently held.

"THE ANNUAL GRADUATE FORTNIGHT is held in October each year, and consists of a series of lectures and co-ordinated clinics, clinical demonstrations and courses in hospitals and teaching institutions on a subject which is of outstanding importance in the practice of medicine and surgery.

"All meetings and lectures held at the Academy are open to the profession generally and to medical students."

NEW YORK'S CLINICAL RESOURCES

Previous mention has been made of the vast clinical resources of New York. The hospitals of the city contain over 34,000 beds, or more than 10 per cent of the general hospitals of the country. In them upwards of 500,000 patients are cared for each year. Ninety-four hospitals, having an aggregate of about 25,000 beds, offer opportunities for postgraduate medical study.

Many hospitals are affiliated with postgraduate and undergraduate medical schools and offer courses under the auspices of these schools. Eight important special hospitals not affiliated with medical schools offer short courses in certain clinical specialties. The opportunities for postgraduate medical study which these hospitals offer consist of courses, special internships or residencies, research appointments, assistantships, clinics and clinical conferences. These opportunities occur in forms such as will meet the needs of medical men engaged in every line of practice, teaching or research.

They may be classified as:

Comprehensive graded courses and residencies leading to specialization.

Fundamental basic science courses for the general practitioner, for the specialist and for the worker in an allied science.

Opportunities for the specialist to observe the latest methods used in the practice of men pre-eminent in the specialties.

Opportunities for the general practitioner to obtain the more recent viewpoints and to observe new procedures in special lines of work, new methods of diagnosis and of treatment.

COURSES

The survey of postgraduate medical education in New York City has constituted one of the important undertakings of the Committee on Medical Education since its

organization in 1924. The survey has been carried on from year to year with a view to improving the value of existing opportunities and encouraging the development of additional ones. The Committee has given its approval only to those courses which after investigation have been found to be well organized, with adequate equipment and clinical material, and given by physicians of character who are known to be qualified teachers in their special lines of work. At the completion of each year's survey the Committee has revised and published a series of twelve "Synopsis of Approved Opportunities for Postgraduate Medical Education offered in New York City in the Clinical Specialties." It has also published a synopsis of opportunities for postgraduate study in laboratory and basic medical science subjects.

The number and variety of the courses announced in the synopses may be seen in the following summary:

DERMATOLOGY AND SYPHILOLOGY—

A comprehensive course of one or two years. Twenty-five courses of six weeks to three months.

INTERNAL MEDICINE—

Seventy-one courses of from six weeks to three months.

NEUROLOGY AND PSYCHIATRY—

Fifty-one courses of from six weeks to three months.

OBSTETRICS AND GYNECOLOGY—

Nineteen courses of from two weeks to three months.

OPHTHALMOLOGY—

Twenty-eight courses of from one month to two years.

OTOLARYNGOLOGY—

Fifty-nine courses of from one month to one year.

COMBINED EYE, EAR, NOSE AND THROAT—

One month to twelve months.

PEDIATRICS—

Thirty-four courses of from one month to six months.

ROENTGENOLOGY—

Fourteen courses of from one month to six months.

SURGERY—

Thirty-four courses of from six weeks to 2½ years.

ORTHOPEDIC, TRAUMATIC, PLASTIC AND REHABILITATION SURGERY AND PHYSICAL THERAPY—

Forty courses of from one to two months.

UROLOGY—

Fifteen courses of from one to six months.

RESIDENCIES IN THE CLINICAL SPECIALTIES

Residencies in the important clinical specialties are available in New York hospitals to qualified medical men who desire to undertake in this way to prepare themselves for special practice. There are 336 residencies offered which have been approved by the American Medical Association. Many of them carry a stipend of \$50 to \$100 per month in addition to maintenance. In most instances the term of service is from one to two years.

Listed according to specialty the residencies number:

Anesthesia—4
Cancer—7
Eye and Ear, combined—19
Gynecology—6
Medicine—19
Neurology—40
Obstetrics—12
Obstetrics and Gynecology,
combined—10
Ophthalmology—13
Orthopedics—25
Otolaryngology—19

Otolaryngology and Ophthalmology,
combined—13
Pathology—8
Pediatrics—26
Physiotherapy—1
Psychiatry—61
Radiology—1
Roentgenology—14
Skin and Cancer—7
Surgery—20
Tuberculosis—6
Urology—5

The Committee has prepared a booklet or guide for the use of visiting medical men, particularly for those whose stay in the city is limited. The booklet is entitled "Opportunities for Postgraduate Medical Study Offered in the Hospitals of New York City." It contains much of the information which I have included in this paper but presents it in more detail, particularly as regards operative and non-operative clinics and conferences. The body of the booklet consists of a description of the special facilities for postgraduate study which each of the listed hospitals offers, and includes the names of the attending medical men and their days and hours of attendance.

BUREAU OF CLINICAL INFORMATION

The Committee on Medical Education maintains at the Academy a Bureau of Clinical Information where detailed information is available regarding opportunities for post-graduate medical study in Greater New York, and also in other cities of the United States, Canada and Europe. Information in regard to graduate medical work in England and on the continent is being added to and kept up to date by publications and reports received from abroad through representatives of the committee and societies, and from interviews with American medical men who have recently returned from a period of foreign study.

The Bureau publishes each evening a "Daily Surgical Bulletin" in which are listed the operations to be performed the following day in the clinics of 65 hospitals. The Bulletin is mailed to visiting physicians in time to be delivered at their residence by eight o'clock in the morning.

The Bureau also publishes a "Bulletin of Non-Operative Clinics and Conferences" which announces clinics given in 61 approved hospitals of the city. A total of 176 clinics are listed. The subjects of the clinics include general medicine, allergy, arthritis, cardiology, diabetes, endocrinology, gastro-enterology, health clinics, mental clinics, metabolism, neurology and psychiatry, obesity, occupational diseases, pediatrics, physical therapy, pulmonary diseases including phthisis, anesthesia, blood transfusion, bronchoscopy, cancer, gynecology, dermatology and syphilology, ophthalmology, otolaryngology, proctology, radium therapy, roentgenology, surgery and urology. Physicians are welcome at all of the clinics announced in both the "Bulletin of Operative Clinics" and the "Bulletin of Non-Operative Clinics and Conferences."

This brief statement of opportunities for postgraduate medical study in Greater New York would be quite inadequate if further mention were not made of the many medical meetings which are held in the city during the

"Academic year." Besides the stated meetings of the Academy and of its twelve sections, more than forty other medical societies meet in the Academy building. Programs are announced in advance in "Medical Week," the official organ of the Medical Society of the County of New York, and are posted on the Academy bulletin board. The stated and section meetings of the Academy are also announced in the Academy "folder" which is issued twice each month. Copies of the folder are mailed free to physicians who request it.

THE EDWARD N. GIBBS MEMORIAL PRIZE FUND

The income of this fund, amounting to approximately \$1,000 annually for three years, is available for research upon diseases of the kidney.

Workers in properly equipped laboratories desiring to apply for a grant in this fund may make application to the Committee of the Edward N. Gibbs Memorial Prize Fund, The New York Academy of Medicine, 2 East 103rd Street, New York City.

LIBRARY NOTES

HISTORY REPEATS ITSELF

The following paragraphs have been selected from an address on the medical libraries of New York delivered by Dr. Samuel S. Purple before The New York Academy of Medicine on January 18, 1877, on taking the chair as President for a second term. It is interesting to note that his pleas are most applicable to our needs of to-day. His address was a fine apologia for the Library of the Academy. We have grown in stature since 1877, but we should go on developing. We envy Dr. Purple's pleasure in discovering the little treatise of Samuel Bard which he gave to the Academy. Probably this Library owes more to Dr. Purple than to any other man.

"A popular error exists in the profession, and it has done much to retard the establishment of a good reference medical library in this city. There are not a few who believe that only the best books and latest editions are worth preserving. This idea has tended greatly to retard the growth of our own Library during even the past two years. No book or pamphlet is worthless; every waif from the mental laboratory of the practical physician contains a fact, or, it may be a statement of facts, which however darkly concealed or obscured by peculiarities of language or description, will ultimately be unearthed, and serve the genius of practical medicine or medical history. In illustration of the truth of this statement, witness the recent disclosure which your speaker made first in the Section on Obstetrics and the Diseases of Women and Children, and afterwards in this Academy, that more than a century since Drs. Colden and Bard described here epidemics of diphtheria—the scourge of our city in these days."

"The description of this disease by Dr. Colden, in 1753, lies concealed in a somewhat scarce and neglected publication of a long since extinct medical society of London;* whilst the description of the epidemic of this disease in this city, in 1770, by Dr. Samuel Bard, is contained in this little brochure** which your speaker rescued from the press-box of a second-hand paper-dealer in this city *in transitu* to the maw of a paper-mill. Its former owner had sold it for the eighth part of a cent, or at the rate of two cents per pound. . . ."

*Medical Observations and Inquiries by a Society of Physicians of London Vol. I. London, 1757.

**An Enquiry into the Nature and cure of the Angina Suffocativa, or Sore Throat Distemper, as it is commonly called by the Inhabitants of this City and Colony. By Samuel Bard, M.D., and Professor of Medicine in King's College, New York. New York: MDCCLXXI.

ARCHIBALD MALLOCH

COLLECTION OF LANTERN SLIDES

The beginning has been made for a service which the library hopes will grow to be of value to those who wish to borrow slides for lectures. For facilities of selection the type of storage case has been installed which exhibits fifty-six slides on each rack when pulled out. The case holds 1,500 altogether.

It is hoped that the Library can accumulate the best examples of anatomical and pathological pictures in color and those diagrams most valuable for teaching purposes, as well as portraits and material with a bearing on the history of medicine.

As an example a gynecologist retired from practice has given 400 slides to the Library and finds that for a lecture that is now-a-days only occasional, he can make his selection much more handily from these racks than he used to do from the boxes in his office.

Slides made from illustrations in books can in no way compare with slides made from the original pathological specimen or from the original drawing. Therefore slides from the original drawing are preferred.

When a member or prospective donor is having any slides made, the negative from which the slide is made should be preserved or sent to the Library in order that duplicates may be printed in the future, or, for the Library collection. One is apt to forget this intermediate step and let the slide maker discard the negative.

R. L. D.

RECENT ACCESSIONS TO THE LIBRARY

- Antognetti, L. *Precocità patologiche*.
Bologna, Cappelli, [1929], 98 p.
- Baglioni, S. *Elementi di fisiologia umana*.
Roma, Bardi, 1929, v. 1.
- Barbàra, M. *I fondamenti della biotipologia umana*.
Milano, Soc. An. Ist. Ed. Scient., 1929, 122 p.
- Barber, T. H. de T. D. *The treatment of varicose veins of the lower extremities by injections*.
Bristol, Wright, 1929, 120 p.
- Bazy, P. *Urologie pratique*.
Paris, Gauthier-Villars, 1930, 536 p.
- Bier, A.; Fehlow, W.; Gehrke, A.; [et al]. *Über Organhormone und Organtherapie*.
- Brooks, C. E. P. *Climate*.
London, Benn, 1929, 199 p.
- Campbell, J. M. *Those teeth of yours*.
London, Heinemann, 1929, 141 p.
- Cumberbatch, E. P. *Essentials of medical electricity*. 6. ed.
London, Kimpton, 1929, 443 p.
- Das, K. *Obstetric forceps*.
Calcutta, Art press, 1929, 903 p.
- Davies, H. M. *Surgery of the lung and pleura*.
London, Milford, 1930, 355 p.
- Dibblee, G. B. *Instinct and intuition*.
London, Faber [1929], 394 p.
- v. Economo, C. *Die Encephalitis lethargica*.
Berlin, Urban, 1929, 251 p.
- Ergebnisse der gesamten Tuberkuloseforschung*.
Leipzig, Thieme, 1930, v. 1.
- Ewen, C. L'E. *Witch hunting and witch trials*.
London, Paul, 1929, 345 p.
- Fay, B. *Franklin, the apostle of modern times*.
Boston, Little, 1929, 547 p.
- Fisher, V. E. *An introduction to abnormal psychology*.
N. Y., Macmillan, 1929, 512 p.
- Flinker, A. *Studien über Kretinismus*.
Leipzig, Deuticke, 1930, 121 p.
- Gallichan, W. M. *The sterilization of the unfit*.
London, Laurie, [1929], 192 p.
- Goodnow, M. *The technic of nursing*. 2. ed.
Phila., Saunders, 1930, 460 p.
- Gutmann, R. A. C. *Les syndromes douloureux de la région épigastrique*.
Paris, Doin, 1930, 2 v.
- Hédon, C. E. E. E. *Précis de physiologie*. 10. éd.
Paris, Doin, 1929, 869 p.

- Jellett, H. & Madill, D. G. A manual of midwifery. 4. ed.
London, Baillière, 1929, 1281 p.
- Jesioneck, A. Tuberkulose und Haut.
Giessen, Töpelmann, 1929, 370 p.
- Jones, F. W. Man's place among the mammals.
London, Arnold, 1929, 372 p.
- Kelley, I. V. Textbook of nursing technique. 2. ed.
Phila., Saunders, 1930, 385 p.
- Kirchberg. Le liquide céphalo-rachidien dans la syphilis.
Paris, Maloine, 1929, 156 p.
- Koch, W. & Wieck, W. Anatomische Analyse des Röntgenbildschattens
des Herzens.
Jena, Fischer, 1930, 137 p.
- Kopeloff, N. Man vs. microbes.
N. Y., Knopf, 1930, 311 p.
- Krethlow, A. Physikalisch-technisches Praktikum für Mediziner.
Berlin, Springer, 1930, 232 p.
- Lane, (Sir) W. A. The prevention of the diseases peculiar to civilization.
London, Faber, 1929, 99 p.
- Lecène, P. Chirurgie des os et des articulations des membres.
Paris, Masson, 1929, 591 p.
- Lull, R. S. Organic evolution. Rev. ed.
N. Y., Macmillan, 1929, 743 p.
- Maxwell, J. L. The diseases of China. 2. ed.
Shanghai, 1929, 530 p.
- Merck's index. 4. ed.
Rahway, N. J., Merck, 1930, 585 p.
- Muse, M. B. A textbook of psychology for nurses. 2. ed.
Phila., Saunders, 1930, 416 p.
- Oaks, L. W. & Merrill, H. G. Your nose, throat, and ears.
N. Y., Appleton, 1929, 167 p.
- Passow, A. & Claus, H. Anleitung zu den Operationen am Gehörorgan, an
den Tonsillen und an der Nase. 3. Aufl.
Leipzig, Barth, 1929, 164 p.
- Pauchet, V.; Luquet, G. & Hirschberg, A. Ulcères de l'estomac et du
duodénum.
Paris, Doin, 1929, 350 p.
- Perard, V. Anatomy and drawing.
London, Batsford, [1929], xx p., 91 pl.
- Pollak, E. Der Kopfschmerz und seine Behandlung.
Leipzig, Deuticke, 1929, 158 p.
- Pusey, W. A. The care of the skin and hair.
N. Y., Appleton, 1929, 182 p.
- Rolleston, J. D. Acute infectious diseases. 2. ed.
London, Heinemann, 1929, 419 p.

Saidman, J. Introduction à l'actinothérapie rationnelle; la sensitométrie cutanée.

Paris, Doin, 1930, 294 p.

Schafer, E. A. S. Essentials of histology. 12. ed.

London, Longmans, 1929, 628 p.

Schwarz, O. Medizinische Anthropologie.

Leipzig, Hirzel, 1929, 383 p.

Starling, E. H. Principles of human physiology. 5. ed.

London, Churchill, 1930, 1039 p.

Surgical diagnosis. Edited by E. A. Graham.

Phila., Saunders, 1930, 2. v.

Trial (The) of Jim the Penman.

London, Bles, [1930], 269 p.

Williams, J. F. & Hughes, W. L. Athletics in education.

Phila., Saunders, 1930, pp. 11-114.

Woodger, J. H. Biological principles.

N. Y., Harcourt, 1929, 498 p.

TWO GIFTS TO THE RARE BOOK ROOM

From Dr. Rosenbach we have received a magnificent gift, a companion-piece to our 1478 edition of the works of Mesue. It is a so far unique copy of the *Antidotarium* of Nicolaus Salernitanus, [Paria, Franciscus de Sancto Petro, 1478-79]. Although it lacks a colophon, the attribution is certain, for it was originally bound up with a Mesue of that imprint, the type and set-up of which were identical. Like the Mesue then, it is a beautifully printed book and rubricated throughout. And though, eventually, other copies are bound to appear (as in the case of its companion-piece, our once unique Mesue) it will always be a rare and valuable item. The book has been rebound by Sangorski and Sutcliffe in black pressed morocco.

Mr. Pierpont Morgan has kindly presented us with our first example of fore-edge painting, and double fore-edge painting at that. It is on a medical thesis, *De Arthritide*, by a certain Joannes Booth, which was printed in Edinburgh in 1805. The paintings are three portraits of doctors, on one side William Harvey, on the other, John Hunter and Edward Jenner. The binding is red straight-grained morocco stamped in gold.

L. F.

IN MEMORY OF MANSON

The Royal Society of Tropical Medicine and Hygiene is asking for help to build a home for the Society which shall bear the name of Patrick Manson. The Fellows and Friends of the Society have already subscribed \$30,000 and an additional \$100,000 is asked for. "The immediate object is to save Manson's work from being hampered in its development. The Society is the link between members scattered over the world. Its *Transactions* are indispensable; the spirit of comradeship in a common enterprise which it has done so much to create and sustain is fruitful at all times of benefit; its influence continues to grow. Such an enterprise needs a place that it may call its own. This appeal is addressed to every citizen of the Empire, but especially to those citizens who have business in tropical countries and to those who deal in the products of the tropics. They are Manson's beneficiaries, whether or not they know it. The work which Manson did, moreover, is only a beginning. New triumphs await new workers. The motto of the Royal Society of Tropical Medicine and Hygiene—namely, *Zonae torridae tutamen*—is the watchword of the new Imperialism which gives rather than gets. What more excellent habitation for this spirit than 'Manson House'?"

In an effort to bring the matter before the British public The London Times of December 18, 1929 said, "PATRICK MANSON left the world in his debt. By his discovery in Amoy in 1877 that the filarial worm, the cause of elephantiasis, is conveyed from victim to victim by a mosquito, he laid the foundation of tropical medicine. Before he died other workers had proved that insects convey also malaria, sleeping sickness, yellow fever, plague, and typhus. All these workers built upon his labours; all acknowledged his inspiration. Tropical hygiene is his child. This man, in short, changed the face of the world; he made habitable areas into which, before him, white men penetrated only to die, and he pointed the way to a security in tropical lands which is now being achieved. Already millions owe

their lives to him; and the number of those who have been enabled by his work to labour without loss of health is beyond computation. This is the small beginning. But a world which has done honour to Pasteur and Lister freely and with alacrity has shown itself indifferent towards Manson. Any memorial of him is still lacking in the capital of the Empire, which from hour to hour gains advantage from his genius and derives, among other nations, imperishable lustre from his name."

PROCEEDINGS OF ACADEMY MEETINGS

MARCH

STATED MEETINGS

Thursday Evening, March 6, at 8:30 o'clock

Program presented in cooperation with the

New York Pathological Society and the Section of Genito-Urinary Surgery

ORDER

- I. EXECUTIVE SESSION
Election of Fellows
- II. PAPERS OF THE EVENING
 - a. Clinical applications of bladder tumor pathology, Paul W. Aschner
 - b. Surgical treatment of cancer of the bladder, Verne C. Hunt, Mayo Clinic (by invitation)

Discussion, James Ewing, Edward L. Keyes, Benjamin S. Barringer
- III. EXECUTIVE SESSION—SECTION OF GENITO-URINARY SURGERY
Appointment of Nominating Committee

Thursday Evening, March 20, at 8:30 o'clock

THE SIXTH HARVEY LECTURE

"A chemical view of the pathogenesis of tuberculosis"

ESMOND LONG

Professor of Pathology, University of Chicago, School of Medicine

G. CANBY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for March.

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, March 4, at 7:45 o'clock

ORDER

I. PRESENTATION OF PATIENTS

Cases from the New York Post Graduate Medical School and Hospital
Skin Clinic

II. MISCELLANEOUS CASES

III. DISCUSSION OF CASES

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

NOTE: Examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, March 7, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. Duodenal fistula; two cases, J. V. Bohrer

b. Cases illustrating the clinical value of gastrophotography (lantern
slides), Paul W. Aschner, Maurice Berck (by invitation)

III. PAPER OF THE EVENING

The immediate and late results of sub-total gastrectomy for the radical
cure of gastric and duodenal ulcer, A. A. Berg

Discussion, John Douglas, Seward Erdman, Harold Santee

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF NEUROLOGY AND PSYCHIATRY

Joint meeting with

THE NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, March 11, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

a. Observations upon the structure of the neostriatum. A compara-
tive study, Walter M. Kraus, W. A. Horwitz (by invitation)

Discussion, Louis Hausman, Louis Casamajor

b. Origin and formation of the senile plaques, Armando Ferraro (by
invitation)

Discussion, Joseph H. Globus, Lewis Stevenson, Louis Casamajor,
Boris Kwartin

III. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF HISTORICAL AND CULTURAL MEDICINE
THE 51st MEETING

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - a. The Physician of the Dance of Death (lantern slides), A. S. Warthin, Professor of Pathology, University of Michigan (by invitation)
 - b. The Two Hunters (lantern slides), Francis R. Packard, Philadelphia (by invitation)
 - c. John of Arderne, a mediaeval English surgeon (lantern slides), Frank S. Mathews
- III. EXECUTIVE SESSION
Appointment of Nominating Committee

SECTION OF PEDIATRICS

Thursday Evening, March 13, at 8:30 o'clock

ORDER

- I. PAPER OF THE EVENING
Roentgenology of the upper respiratory tract in children, with special reference to thymic obstruction and its complications, and the diagnosis from other obstructing conditions, Henry K. Pancoast, Philadelphia (by invitation), E. P. Pendergrass, Philadelphia (by invitation)
- II. General discussion opened by Webster W. Belden (by invitation), John Remer, Howard H. Mason
- III. EXECUTIVE SESSION
Appointment of Nominating Committee

SECTION OF OTOTOLOGY

Friday Evening, March 14, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF PATIENTS
- III. PAPERS OF THE EVENING
 - a. A new operation for chronic mastoiditis (lantern slides)
Demonstration of patients, J. Morrissey Smith
Discussion, John R. Page
 - b. Masking effect of an interfering tone on a deafened ear, John Guttman, L. B. Ham
Discussion, Mr. R. L. Wegel, Bell Telephone Laboratories (by invitation), H. F. Williams, Columbia University (by invitation), Isidore Friesner, Thomas J. Harris
- IV. EXECUTIVE SESSION
Appointment of Nominating Committee

SECTION OF OPHTHALMOLOGY

Monday Evening, March 17, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

A preliminary report of a case of metastatic carcinoma of the optic nerve and choroid, Clyde E. McDannald

A case for diagnosis, R. E. Meek

III. PAPER OF THE EVENING

The Gonin operation for retinal detachments, Mark J. Schoenberg

a. Microscopic findings in experimental igni puncture of the retina, G. Hertzfeld (by invitation)

b. Optical considerations in the localization of the tear in the retina H. A. Goalwin (by invitation)

c. The Weekers method of experimental production of retinal detachments, V. R. Syracuse (by invitation)

Discussion, Arnold Knapp, Edgar S. Thomson, Alfred Wiener

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF MEDICINE

Tuesday Evening, March 18, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

The treatment of diabetes as influenced by—

a. New aspects in its pathology (15 minutes), Shields Warren, Boston (by invitation)

b. Diabetes in childhood (15 minutes), Priscilla White, Boston (by invitation)

c. The growing importance of pernicious anemia and coronary disease as complications (15 minutes), Howard F. Root, Boston (by invitation)

d. The end result of patients undergoing treatment between 1898 and 1929 (20 minutes), Elliot P. Joslin, Boston (by invitation)

Discussion, Frederick M. Allen, Nellis B. Foster, Henry R. Geyelin, Herman O. Mosenthal

II. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, March 21, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. Motion picture demonstration of technique for spine fusion, Barclay W. Moffat

III. PAPER OF THE EVENING

Observations on the pathology of bone tuberculosis, with particular reference to incidence of tuberculous bacilluria, Robert I. Harris, Toronto (by invitation)

Discussion to be opened by A. R. Stevens

IV. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, March 25, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CASE REPORTS

a. Adeno-carcinoma of ovary, Arthur Stein (2 cases)

b. Adeno-acanthoma of uterus, Arthur Stein

Discussion, Alfred Plaut, W. P. Healy, Frank Torek

III. PAPER OF THE EVENING

The treatment of uterine prolapse and its associated pathology by the interposition and LeFort operations, Frederick C. Holden

Discussion, Robert T. Frank, Byron H. Goff, H. J. Epstein, William P. Driscoll

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, March 26, at 8:30 o'clock

NOTE: Examination of cases will start at 8 o'clock.

SUBJECT: "The larynx"

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

a. Anatomy and physiology of the larynx, C. J. Imperatori

b. Analysis of cases of laryngeal carcinoma seen since October, 1929, O. M. V. Schmidt

c. Thyrotomy—indications, technique and end results, Gabriel Tucker, Philadelphia (by invitation)

Discussion, C. J. Imperatori, Sidney Yankauer

III. PRESENTATION OF CASES

a. Differential diagnosis as illustrated by the following cases (from the bronchoscopic clinic, Manhattan Eye, Ear and Throat Hospital)

1. Chronic inflammation

2. Benign growth

3. Keratosis (3 cases)

4. Carcinoma
5. Sarcoma
6. Tuberculosis
7. Syphilis

David H. Jones

- b. Chronic subglottiditis—3 cases, Rudolph Kramer
- c. Rhino-scleroma with laryngeal involvement, G. Allen Robinson
- d. Laryngectomy—for carcinoma of the larynx and thyroid gland,
M. S. Bender (by invitation)

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Appointment of Nominating Committee

NEW YORK MEETING of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday, March 19, at 8:15 o'clock

(PROGRAM INCOMPLETE)

- I. The etiology of the disease psittacosis, C. Krumwiede, M. McGrath,
C. Oldenbusch
 - II. The dietary production of dystrophy of the voluntary muscles, M.
Goettsch
Introduced by A. M. Pappenheimer
 - III. Pathological changes in the skeletal muscles produced by dietary
means, A. M. Pappenheimer
 - IV. A thermal conductivity recorder of O and CO₂ for clinical atmosphere
control, G. Lubin, J. G. M. Bullowa
Introduced by W. H. Park
 - V. Observations on streptococcus toxin-antitoxin neutralization as a basis
for specificity, M. W. Wheeler
Introduced by A. B. Wadsworth
 - VI. Identity of animal anaphylaxis and human allergy (protein hyper-
sensitiveness), B. Ratner, H. L. Gruehl
 - VII. Absorption of glucose galactose mixtures in the intestine, H. Sobotka,
M. Reiner
Introduced by L. Gross
 - VIII. A carbohydrate isolated from monilia psilosis, D. H. Cook, H. D.
Kesten, J. W. Jobling
- Peyton Rors, President
A. J. Goldforn, Secretary

FELLOWS ELECTED APRIL 3, 1930

Else Anna Barthel.....	17 West 54th Street
Thomas M. Brennan.....	39 Eighth Ave., Brooklyn
Milton J. Goodfriend.....	1186 Grant Avenue
Peritz M. Kurzweil.....	224 East 12th Street
Louis T. Wright.....	218 West 139th Street

AND FOR ASSOCIATE FELLOWSHIP:

Henry Drysdale Dakin, D.Sc.....	Edgehill, Scarborough-on-Hudson
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DEATHS OF FELLOWS OF THE ACADEMY

GUSTAV ADOLPH FRIED, M.D., 64 West 85th Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1903; elected a Fellow of the Academy April 1, 1909; died, March 20, 1930. Dr. Fried was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Pathological Society and a member of the Society of Associated Alumni of Mt. Sinai Hospital.

PETER DAVID SHULTZ, M.D., 601 West 156th Street, New York City; graduated in medicine from New York University, New York City, in 1896; elected a Fellow of the Academy May 3, 1904; died, March 21, 1930. Dr. Shultz was a Fellow of the American Medical Association and a member of the County and State Medical Societies.

JUNIUS WINFIELD STEPHENSON, M.D., 20 West 50 Street, New York City; graduated in medicine from the Medical College of Virginia, Richmond, in 1907; elected a Fellow of the Academy, October 4, 1917; died, March 8, 1930. Dr. Stephenson was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Psychiatric Society and a member of the Neurological Society. He was Neurologist to the Neurological Institute and Assistant Neurologist to Bellevue Hospital. He was Secretary of the Section of Neurology and Psychiatry from October 1927 through September 1928 and Chairman of that Section from October 1928 through September 1929.

MILTON RAPHAEL WALTER, M.D., 118 West 79th Street, New York City; graduated in medicine from the University of Maryland, Baltimore, in 1893; elected a Fellow of the Academy November 6, 1919; died March 20, 1930. Dr. Walter was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, Consulting Oto-Laryngologist of the Correction Department and Chief Otologist, Rhinologist and Laryngologist to the French Hospital, Out Patient Department. He was also a member of the County and State Medical Societies.

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No. 5

ANNUAL GRADUATE FORTNIGHT

*Functional and Nervous Problems
in Medicine and Surgery
October 7 to 19, 1929*

PSYCHOTHERAPY *

WILLIAM A. WHITE

Superintendent, St. Elizabeth's Hospital, Washington

The term psychotherapy, I am sure, is familiar to you. Its meaning, it would seem, is sufficiently obvious. Therapeutics is that branch of medicine that is engaged in the application of remedies either for the cure or the amelioration of disease or for the relief of suffering. Psychotherapy is that branch of therapeutics that deals with the application of remedies directly to the mind, and obviously and by implication the type of disorders which are dealt with by psychotherapeutic measures are the disorders which are of mental origin or, as we say, are psychogenic—having a psychic or mental genesis. All this is very simple, and yet the subject itself is very far from simple and at the outset I find myself considerably embarrassed because my own conception of the nature of psychotherapy and the way in which it works is bound up with my conceptions of the nature of the human organism, and more particularly of the human mind and its multitudinous relations both within itself and to its environment. However, I will assume, as of necessity I must, that I can speak of such matters in the usual language and that our ideas,

* Delivered October 18, 1929.

yours and mine, will run sufficiently parallel so that I will run no risk of being seriously misunderstood.

Perhaps I might, however, pause to say this: that the mind is quite as complicated a structure as the body, and that in order to deal with it one needs to know its structure. No physician would undertake an abdominal operation without having studied the anatomy of the abdominal organs, and so no psychotherapist ought to undertake a psychological operation without beforehand having studied the structure and functions of the mind. In the old days when anatomy was a tabooed subject and all that the physician knew about the inside of the body he gained by looking at the outside, a surgical operation for an appendicitis would have been quite unthinkable. Even the diagnosis would have been impossible. And so now a person may have a mental difficulty of some sort and he may apply for some assistance but this assistance can not be safely rendered by anyone, and certainly not by anyone who knows nothing about the structure and functions of the mind as witness the utter futility of telling a person who has a delusion that it is all nonsense or imagination. To do so might be considered a psychotherapeutic procedure just as the application of a salve to the abdomen in the case of peritonitis might be considered a therapeutic procedure. But in both instances the classification of the procedure as therapeutic does not insure its having any value, and both procedures are quite useless. So that just as the surgeon has to have a long preliminary training in anatomy, physiology, pathology and surgical technique in order to deal with appendicitis, so the psychotherapist has to have an equally long training in psychology and psychopathology and psychotherapeutic technique.

I make these parallels so that you will be prepared for considering the subject of psychotherapy as a considerably more complicated affair than you might have thought, and further as having ramifications and directions where you might easily not look for them. If we were to approach this problem of psychotherapy and endeavor to

deal with it in an exhaustive manner we would find much illumination in a consideration of its historical aspects. I have before me as I write the monumental work of Professor Janet on this subject. It is contained in three volumes, totaling considerably over one thousand pages. It is impossible, of course, in the short space of a single lecture to do more than to mention certain aspects of this history which are illuminating for our present purposes.

The farther we go back in the history of what has been called in this country "mind cure," the more closely do we find the methods of psychotherapy associated with miracles, with methods that can only be properly termed magical, and, as we might expect, associated with religion, for we must remember that in the earliest days the physician and the priest were one. Not to dwell upon these religious miracles and magic of the early days but to come down to more recent times, we find hypnotism in its various forms playing a large part as a method of psychotherapy. Of this particular aspect I shall speak somewhat a little later, but along with the growth and utilization of methods that were in the nature of hypnotism or, to use a broader term, suggestion, and as a reaction to some extent against the use of such methods but perhaps more particularly against the remnants of the miracles and magic which still persisted, and do yet for that matter, we find a parallel development represented in ancient times by the treatment by repose, the temple sleep of the ancients, and in recent times by the method of isolation which was practiced so extensively by Professor Weir Mitchell in Philadelphia. In this particular method, as you know, the patient is separated entirely from his family and friends, occupies a single room in a hospital, and sees no one but his nurse and his physician. Added to these rather rigorous methods of treatment was the procedure that was much in vogue twenty-five or thirty years ago, the intellectual method or moral method of Professor Dubois, who undertook to convince his patients by reason. And last of all there has been the development of psychoanalysis, which has already expressed itself in various

ways to which I shall refer later. Interest in all of these methods of cure has been greatly aroused during the present century, because of the development of psychoanalysis on the one hand and also because of the experience in the war on the other.

The World War developed an enormous number of psychogenic disorders which could only be treated psychotherapeutically, and all the various methods were brought into operation as far as they were practicable. Hypnotism and suggestion in one form or another were much in vogue, as were various subterfuges and indirections by which the soldier who was ill was gradually coaxed back, as it were, to some degree of health. One of the more notable developments of war psychotherapy was that of the so-called "torpillage" of the French, which stands out in contrast to these other methods, most of the methods being used, by implication at least, upon the principle of making it easy for the patient to get well, offering a premium, as it were, to recover, whereas the French torpillage was constructed upon exactly the opposite principle. Here the soldier confronted an entirely different situation. Instead of having the path of recovery made easy he had the path of continuing illness made difficult. Finally he found it more uncomfortable to stay sick than to get well and carried on as a sort of self-defense against the treatment. It is a similar principle that was much in use in the last century and which was expressed by giving the hysterical girl nauseating doses of valerian and asafetida. These drugs really acquired their reputation because of their disagreeable taste and odor. For minor disorders the patients would rather exert their power of self-control than to have to take such medicines.

By a survey of the sort of material one finds treated by these various methods made in the light of our present-day knowledge, certain facts come to the fore quite obviously. In the first place we are impressed by the fact that a great many conditions have been treated in the past by psychotherapy that were obviously unsuited to that method of

approach. We have many such experiences to-day with reference to the various cults that flourish throughout the world. We are always more or less in a state of antagonism with the Christian Scientists and the osteopaths and various other exponents of therapeutic methods, because they seem to insist upon treating such things as broken legs and diphtheria by methods that are essentially an appeal to the mind and the physician is not yet able to see just how a psychotherapeutic approach can solve the questions presented by the patients in the instances cited. Leastwise perhaps it might be better to say that while an appeal to the mind might not theoretically be useless either in a broken leg or in a patient suffering from diphtheria, for purposes of quieting apprehension, relieving feelings of depression and the like, still the primary attack should in the first instance be surgical and in the second immunological. So that a psychotherapeutic approach while it may not be one hundred per cent negative for all the purposes and objects of treatment of these particular types of patients, to resort to it exclusively avoids the obviously main issues with the result that the leg heals in bad position, is short or crooked, and thereafter functions poorly, or the patient dies of an overwhelming toxemia, while the therapist fiddles around with unessentials.

The next fact, which is not by any means so obvious but which is nevertheless equally important, is that there are many conditions which superficially appear to be outside the field for the legitimate application of psychotherapy as a principal agent of cure but which nevertheless belong within that field. A patient comes to the hospital who is blind, for example. The first thought would not be that here we have a mental disorder, but that we were dealing with a disease of the eye. Nevertheless it may be that the blindness is entirely of mental, that is psychogenic, origin, and not only is not susceptible to therapeutic methods applicable solely to the eye as such but is only curable by psychotherapy. I might add that the disorders or, perhaps better, symptoms or groups of symptoms which have swung into the field of psychotherapy during the past few

years have been considerable, so that while modern medicine would limit the field of the application of mental therapy very definitely with reference to certain specific types of illness, in other directions its field is being greatly broadened.

Another fact that comes out and which is still more difficult to see and which has led perhaps to more misunderstandings than any other in this field, is the fact that a great many remedies which appear to be physical in nature really operate because of their psychological significance. The placebo has long been known in medicine, the bread pills and the colored water, but bread pills are administered as a means of application of psychotherapy on the part of the physician. But what the physician as well as the layman does not appreciate very frequently, is that the medicine which he gives on an entirely different theory often works solely because of its influence upon the mind of the patient. Such a conclusion can only be reached by understanding not only what the medicine may do but what transpires in the patient's mind. This fact is vividly illustrated even within the realm of surgery. Aside from the fact that an enormous number of operations in the past have been performed which, so far as the relief of any tangible condition was concerned, were found to be utterly useless, we know nowadays that many operations have been performed for the relief of symptoms which resulted from functional disturbances that were purely mental in origin. We have all seen numerous such cases. Then again there is the experience in surgery, which is paralleled in the field of drug therapy, that there are certain conditions that will always be helped by operation no matter what the operation is just as there are certain conditions that will always be helped by drugs no matter what the drug is. Epilepsy, for example, will always be better after almost anything that is done for the patient either in the way of surgery or drug therapy. And so if we look over the therapeutic history of epilepsy we will find that almost everything conceivable has been advocated and tried and found helpful, both in the way of

drugs and in the way of operations. Medicine is still shot through with remnants from the magical methods and the superstitions of bygone days, often quite completely concealed except for the researches of the antiquarian. These remnants still function in all sorts of medical fads and fancies and are at their best in the field of medical charlatanry. The expansion of this field in the realm of the psychological and psychotherapeutic has been particularly in evidence of late. It is in the region of his greatest ignorance that man is most gullible.

If we bear these factors in mind we will realize that psychotherapy has a value but must only be applied as a major procedure in a certain restricted territory, particularly in that territory in which the symptoms are of psychogenic origin, that this territory is both smaller than had been supposed and larger than is generally thought, that many of the agents that are used for other than psychotherapeutic reasons do have psychological influence, and that there are many mental conditions associated with other conditions which are fundamentally not accessible to psychotherapy which nevertheless can be improved by psychotherapeutic means. It would appear from this, therefore, that there is a certain fairly well-defined group, at least theoretically well-defined, in which psychotherapy is the method of election. There are certain other groups equally well defined in which surgery is the method of election, etc. This is all relatively simple. It is not always so, however, in reality. If you have followed the development in psychological thought in recent years you will realize that the distinctions that have grown up between mind and body are being gradually dissolved. Not that we know anything more about the mind as such and intrinsically than we ever did, but that for practical purposes of therapy, for example, the distinction has been found in recent years to have less and less value. And so, to use a biological term, we have come to think of the organism-as-a-whole and to deal with it therapeutically from that point of view.

Taking this aspect of the question into consideration, therefore, it would seem that when we are dealing with a disorder of an individual that it may easily be solely a question of practical results whether we approach the problem with one form of therapy or another, and it is quite conceivable that we can not tell beforehand just the best method of approach. Medicine remains, to a considerable extent at least, in its therapeutic aspects, empirical, and we are constantly being surprised at the claims and the results of psychotherapy. In other words, the field in which psychotherapy as a method of election is applicable not only is increasing in size but it is invading a territory which we believed until recently belonged entirely to the field of chemistry and physics and it has been rather difficult to understand the results. Here again we are undoubtedly confronted with certain combinations not unlike those to which attention has already been called. If, for example, a patient receives a blow on the head and is paralyzed in one or more limbs following the accident, it by no means necessarily follows that we are dealing here with the physical effects of the blow, which, if we were, would mean that the patient had had perhaps a fractured skull or at least a hemorrhage into the brain with resulting destruction of certain fibres or cells which resulted in the paralysis. The blow on the head may have been only the starting point of his difficulty, which, when we see him, may be practically one hundred per cent mental in nature. In other words, this patient may have received his blow on the head in a railroad wreck and he may have utilized his slight injury as an opportunity to develop serious symptoms which he could use for purposes of collecting damages. Or on the other hand an individual who is essentially shy and retiring may develop a facial eruption and then use the facial eruption as an explanation for his shyness or disinclination to appear in public or to meet people. Under such circumstances it becomes difficult to tell how much of the shyness is due to the eruption and how much of the eruption may be due to the shyness, or at least, if it were not originally due

to shyness, how much his mental attitude may be responsible for maintaining it. Even in some instances the eruption may be maintained by actual physical irritation of the face, not to speak of psychogenic factors more subtle. In all this type of cases naturally the psychotherapeutic approach is of major significance even though there may be other factors, disturbance of function or even of structure, which are demonstrable. If we go beyond such examples as this we are confronted with those alleged cases in which there have been literally revolutions, not only in function but in structure, which have resulted from equally revolutionary changes in the mind of the patient brought about by psychotherapy. All manner of physical ailments may disappear as the result of clearing up a mental condition of major significance in the life of the patient which has disturbed him to his very depths over a long period of years; and if it is extraordinary that such emotional disturbances should result in physical and functional disturbances of a marked nature, it is no less extraordinary how they may clear up following adequate psychotherapy. Time does not permit the discussing of these conditions in detail but the literature is replete with instances.

But the story of psychotherapy is an endless one and it is my desire to get to grips with certain present-day problems and so I will hasten along for "it is a foolish thing to make a long prologue and to be short in the story itself." The two outstanding present-day problems in psychotherapy revolve about the methods of suggestion, on the one hand, and psychoanalysis on the other. To begin with, suggestion is a method which has come over to us through the ages and which, developed to its Nth degree, was the method of hypnotism in its various degrees and by various means that was so much in vogue in the latter part of the last century; and its significance to-day remains very considerable because it of necessity plays a part, openly or in disguise, in every form of therapy. Psychoanalysis, on the other hand, is a much more elaborate procedure, and while it is by no means free, in my

opinion, from the influence of suggestion still it has grown up and developed on the theory that it eliminated suggestion at least as far as that was possible. Until the development of psychoanalysis, however, suggestion remained to a considerable extent a mystery, although the work of Bernheim in France demonstrated very clearly its psychological nature and removed it from the realm of mysticism. Suggestion was conceived to result from the uncritical acceptance of an idea, usually an idea conveyed by another person, and the realization of this idea in action, but it remained for psychoanalysis to explain the why of this process. Very briefly, I can only say that this explanation was found in a study of the development of the psyche and a realization that to a certain extent we all of us remain children throughout our lives, or at least we retain the possibility of childhood reactions. The suggestion is only the coming to the surface of one of those possibilities at a time of stress when we need it. So that when we are sick and necessarily dependent upon others, it is then that like children we are called to accept uncritically the assurance of those others that everything will come out all right, just as we used at one time to run to our mothers and get that assurance when we were in trouble.

And so the defect of various methods of suggestive therapeutics has always been that the method was dependent upon the personality of the therapist and that it involved a relation on the part of the patient of dependence, and further and more important and significant yet, that really nothing happened so far as the patient was concerned except the temporary disappearance of the symptoms. The possibility of their return was always present, either in the form in which they had appeared before or in some other form. So that suggestion merely became a reassurance of the patient for the time being, who at the next stressful moment in his life would again need assurance and who might be so constituted that he felt the need of reassurance so continuously that he became a regular dependent upon the physician for his

daily living. Everyone who has used suggestive therapy, particularly such methods as hypnotism, has seen these phenomena over and over again and has felt only too frequently that he was writing in the sand.

The more recent developments, particularly psychoanalysis in its various forms, have approached the problem quite differently. In this field there has been a continuous effort to understand the meaning of the symptoms, to understand the structure of the symptoms, and roughly speaking as a result of that understanding to develop a technique that would tear down the symptoms, destroy them, as it were, so that they never again could appear in evidence, and then having destroyed the symptoms assist either passively or actively in the building up of a new structure in their place. Such a method of therapy has necessarily involved an entirely new approach to the problems of the mind and to its understanding, and this new approach has been quite analogous in its historical unfoldings to the approach to an understanding of our physical body. The understanding of the mind and of its various symptoms as they may develop under untoward circumstances is dependent upon an understanding of its development both in the individual and in the race; and so this study of psychology has been elaborated in these directions as a part of the equipment of the psychotherapist, and he now undertakes to deal with psychotherapeutic problems upon the basis of what he knows about the structure and functions of the mind and about the historical stages in its development, both individual and racial. This, you will appreciate, is a very large order. It involves not only an understanding of the individual as ordinarily we use that term, but as well of the entire cultural milieu in which he grows up, develops, and which influences him as he influences it. This, roughly speaking, is the great contribution which psychoanalysis has made to modern therapy; and no matter whether we may or may not agree with any specific conclusions that any particular psychoanalyst may have reached as a result of his studies, there can be no shadow of a doubt that

this effort to understand the structure and functions of the mind in quite the same way as we understand the structure and functions of the body, not only their present status but their meaning expressed in terms of origin and history, is the only method by which we can hope to advance in this infinitely intricate and complicated territory.

Now let me tell you something about the more recent developments in psychotherapy, and in doing so I shall perforce have to deal very largely with those developments as they have been brought about by psychoanalysis. In the first place, as I have already said, psychoanalysis has as its primary object the determination of the roots of the psychological difficulties, in other words, a determination of the meaning of the symptoms which the patient presents, as it is realized in this field as in every other field of medicine that unless we understand what the symptoms mean we can not intelligently deal with them. In this respect it differs essentially and radically from all methods of suggestive therapy, in which the symptoms are, as it were, commanded to disappear, the physician using his authority to that end with little or no understanding of the material with which he is dealing. With a knowledge of the meaning of the symptoms, however, two broadly different attacks upon psychogenic disorders may be outlined. The attack may be directed from without or from within. The human organism may be considered in its relation to external stimuli, particularly in relation to noxious stimuli of various kinds, and an effort may be made to cure the symptoms by removing it from the noxious stimuli and subjecting it to stimuli of a beneficent character. This is the method which is used very largely in dealing with young children. It is realized by a study of their disorders that their bad behavior is frequently the result of unwise handling or bad influences in their immediate environment, unintelligent and over-severe or over-solicitous or over-anxious or poorly adjusted parents; and the child is taken out of the home setting, put in the hands of more intelligent, better balanced people, removed

from the influence of bad associates, who are sometimes criminal, alcoholic, psychotic, cruel, etc., and because the child is so plastic and adjustable magical results often follow this method of treatment. On the other hand, and more particularly with adults, it is realized that the factors which make for neurotic illnesses are largely within. In other words, there is what has come to be known as a mental or psychological conflict. The desires, the wishes, the ambitions, the ideals of the individual, are not in harmony. He is not, as Dr. Jung used to say, at one with himself. He finds that his emotions are clashing with one another, and as the host of an emotional conflict he is uncertain, doubtful, apprehensive and unhappy. Such a situation when submitted to analysis will, if the analysis is successful, disclose the origins of these various symptoms, uncover their meanings, which, it must be remembered, are as thoroughly hidden from the patient as from the onlooker. It is the object of analysis to disclose these meanings, particularly to disclose them to the patient, not to tell the patient about them if perchance the analyst knows their meaning, which as a matter of fact he can hardly be expected to except in a general way, but to help the patient to find their meanings, and when the patient does find their meanings he for the first time is in possession of the sort of knowledge which will give him control of his emotions and enable him to deflect his energies from being used in symptom formation into more constructive channels. This is the method of what has been known as reductive analysis, which, briefly, means the reduction of the complex, complicated, intricate symptomatology of the patient to its simpler factors, the theory being that by so doing the energy that is tied up in the symptoms will be released therefrom and can be utilized for better purposes and that if it is so released the patient will spontaneously and of his own motion seek better ways for its utilization.

The time limits of this paper forbid, naturally, a discussion of the whys and wherefores of such statements as these. I will only add at this point that in this method

of analysis the patient is relatively passive, disclosing what comes to his mind. The doctor also is relatively passive, making little or no effort to direct the patient in any way and also making little or no effort at explanation, but trusting that the gradual unfolding of what is in the patient's mind by this process of so-called free association will discover the roots of the trouble. In the earlier days more especially and still to a large extent these roots were supposed to lie in the psycho-sexual life, and the process of analysis which disclosed them was generally conceded of necessity to be a long-drawn-out one lasting regularly for months and not infrequently for years. And it was pointed out that the situation in this respect was not so different from other chronic ailments, notably tuberculosis, that also took years for its cure.

The state of affairs as thus briefly alluded to soon became unsatisfactory, particularly because the roots of all psychogenic disorders were by the theory assumed to have had their origins in earliest childhood and every analysis had to probe to these profound depths before success could be assured. This long and tedious process was beyond the possibilities in a great many cases and the psychotherapist began to look about him to see what changes might be effected in the technique. A number of things have happened in recent years along these lines. By some the suggestion originally made, so far as I know, by Jung, that the actual present existing difficulties should be taken more seriously rather than always undertaking to search for these roots, has led to an effort by many to deal with the problems without this long period of reductive analysis. I have already mentioned how this is done with reference to children and how successful it frequently is. In adults, although the technique is different, some analysts claim results from a relatively short analysis; and a recent attempt has been made to shorten the analysis definitely so that the whole affair can be dealt with within a period of a few weeks. This is the method of setting a time for the termination of the analysis after a certain stage has been reached, on the theory that if the patient

knows that at a certain date his analysis will be finished he will make a greater effort to coöperate and to be through himself by that time. Similar efforts have been made in other directions, as, for example, the effort at stimulating the patient to disclose buried material by what is known as active therapy, which was elaborated first by Ferenczi. Whereas there is a definite tendency in the whole analytic situation of recent years to take more serious account of what is known as the ego ideal, that is, the ideals which the patient has built up for himself in his lifetime, rather than centering the entire therapeutic effort upon the psycho-sexual life. In this way the analysis is bound to bring into the situation questions of ethics and religion. And finally, the tendency has never been quite renounced and is now more definitely in the foreground than ever before of supplementing the reductive analysis by an effort at synthesis, or, as it is more generally called, by associating and adding to the analysis certain efforts at re-education. I may say in passing that this question of re-education seems to be a more vital issue in those conditions in which the ego ideal has not been so well developed, and these are the conditions which are found, roughly speaking, in the various states of defective development, particularly what are known as psychopathic personalities, and in the more serious forms of the psychoses, conditions which until recently have received little attention from psychoanalysis because on the face of them they present such very serious and difficult problems which have little prospect of solution.

And finally let me call your attention briefly to a development which I have thus far only hinted at. If we are to lay aside our distinctions of mind and body or at least to consider such distinctions as of no practical importance then it must follow of necessity that, in an organism functioning as a whole, any disease process, no matter what, must have both mental and bodily components even though in any particular case one or the other may be so prominently in the foreground as to all but completely shut out from view the other. This being so

it is logical to assume that psychotherapy even in admittedly and obviously organic diseases may be of value. These assumptions seem to have been borne out in a number of instances that I have not the time now to discuss. You will find this point of view particularly set forth by Groddeck, of Baden-Baden, and by Jelliffe, of this city. Suffice it to say that while this angle of approach seems to be fruitful of results in certain instances and is thus worthy of continued study, there seems to be very little to go on to indicate what cases may be expected to respond to this line of treatment. In general one may say that good results might be expected in chronic illnesses, especially when everything else has been tried and found wanting, and particularly in those conditions that belong in what I call the silent areas of medicine and about which we know practically nothing as to cause, such diseases, for example, as epilepsy and cancer. It may seem strange to you that such diseases as these should be suggested for psychotherapy but if you have followed me you will understand that they come in logically for such treatment if the principles I have laid down are correct. Certainly such contemplations open up a vista of fascinating possibilities. If this suggestion should prove itself in practice it might mean nothing less than a complete about face of medicine, with the emphasis on the mental which is now on the physical. Such an about face would, of course, involve a most radical change in medical thought, a change, however, of the nature of what is already occurring in other branches of learning.

I have already, I am afraid, wearied you with a rather dry-as-dust discussion of a subject which you might have supposed would have been presented in more interesting form. I could of course have told you of all sorts of dramatic results obtained by psychotherapy, but I feel sure that you already have knowledge of many such instances. The making of the blind to see and of the lame to walk are commonly included in the psychotherapeutic bag of tricks, whether practiced by the serious student or the charlatan. I am anxious that you should carry away

from this discussion something more than a series of such pictures. In the first place, in order that you may appreciate something of the meaning of the whole psychotherapeutic method, let me give you some idea of the requirements which are now being thought of for the practitioners of psychotherapy and the reasons therefor. To understand these requirements one needs to remember that one of the most general functions of the human mind is to smooth out inequalities of emotional balance. It is an organ, if I may use that term, for resolving tensions, for bringing to pass equilibrium in the face of tendencies which are calculated to produce disturbances of equilibrium. In other words, the healthiest and most normal mind is the mind which is most continuously in a state of emotional equilibrium. This means that at any particular moment any particular set of facts is not seriously distorted by that mind. A person whose emotions are evenly balanced does not see things out of focus. He is not overly anxious nor overly solicitous. He is not too severe nor too complacent. His emotions are reasonably adjusted to the situation as it actually is. He does not see enmity and antagonism where it does not exist, nor does he fear dangers which are only made of thin air. And so the psychotherapist must, to begin with, be a well-balanced individual who can appreciate the material the patient brings him at its proper value. This is particularly important because, as I have already intimated, the element of suggestion, try as one will, can not be altogether excluded from the analytical situation; and so it is important, so far as humanly possible, that the physician should be a reasonably stable individual if the patient is going to treat his word as authoritative. And then, perhaps a fact which is little appreciated, I have always insisted that medicine was by no means a scientific affair exclusively. The practice of medicine is in reality an art. It consists in the application, to be sure, of scientific principles, but the when and the how and the where of their application will always be a matter which is controlled by the intuition of the physician, and the keener his intuition the more successful will

be his practice. And finally, in speaking of the qualifications of the physician, one point must be remembered. In the history of the uncovering of the functions of the mind we have been confronted repeatedly by antagonisms of all sorts and descriptions. The inner thoughts and feelings of human beings constitute their most sacred and intimate possessions, and they disclose them with the greatest reluctance and even having done so are loath to see in these possessions undesirable, immoral and destructive components. The disproportionate growth of internal medicine, or the medicine of the body, as opposed to that of the mind is due in no small part to the disinclination of man to acknowledge his moral responsibility for himself but his willingness on the other hand to see the explanation of his difficulties as conditions over which he has no control and for which he is therefore not responsible. It therefore not infrequently happens that the patient who leaves the psychotherapist on the road to recovery and who ultimately gets well will not credit this result to what the physician did for him but will perhaps discover that some pink pills that he has found in the meantime are the real agents which have produced the results. You may not think that the patient who reasons thus is really well, but if he has overcome his symptoms sufficiently at least to lead a constructive social existence and to be possessed of a reasonably happy state of mind I do not see how we can say that he is not well in the ordinary sense of that term. The psychotherapist under these circumstances has to be content with the results attained and satisfied within himself with the knowledge of what he has accomplished and willing to forego the praise and the gratitude of his patient. In this respect we see only another illustration of that relationship of patient to physician which has so many analogies with the relation of child to parent. The physician's attitude must be single minded and his efforts addressed to no other end but the welfare of the patient, and if that welfare is attained he must be content, just precisely as the parent spends years in training the child, who at the end

of this period of training leaves the household without the slightest feeling of appreciation of the many sacrifices that have been made to bring him to this stage of his development. These are high standards to set, but the practice of psychotherapy is a difficult business and of those who successfully meet them there are at present very few.

The whole psychotherapeutic movement, however, is tending in the direction of facts rather than, as in the past, in the direction of mysticism. As more and more facts are accumulated, and, in accordance with the methods of scientific progress in general, these facts are found to conform to natural laws, it will become more and more possible to teach it and, too, to practice it intelligently. As progress moves along in these directions it, too, will undoubtedly lead to changes in technique that will make its application more successful and still further remove it, as a method, from the exclusive control of the few especially qualified personalities. In all these directions it will advance to better things, to more significant conquests of illness, and to changed viewpoints and methods. If it seems to you a somewhat vague and uncertain territory now I hope you may be minded to give it your sympathetic "God Speed" on its way to better things and be interested in its progress and its future.

THE PSYCHONEUROSES *

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The treatment of the psychoneuroses comprises a good part of the modern practice of medicine. There can be no accurate estimation of the prevalence of these conditions for, if one should define them rather broadly, a very large majority of all adult, civilized humans would well come under the classification. Psychoneurotic states, of some degree, are so general that one often feels inclined to dispense with the term as descriptive of a condition and to substitute a term indicating a state of mind. Were such a term to be found we could then speak of psychoneurotic thinking rather than a psychoneurotic state.

Not all psychoneurotics come to physicians for treatment of their psychoneuroses. Many there are who maintain an adequate adjustment to reality, satisfactory, to some degree, to both the psychoneurotic needs and the needs of the life they have to live. Others maintain this balance so long as things go well with their internal physiology, but when disease attacks them they come to the doctor with a mixture of organic disease and psychoneuroses which the disease itself has served to release as a clinical state.

Such is the scope of the subject and its very extent necessitates a rigid restriction of the scope of this paper. Time permits us to consider here, and briefly, only those more striking psychoneurotic mal-adaptations which have been gathered together into clinical states and to which descriptive names have been applied.

To understand the psychoneuroses as products, in part, of civilization one must envisage the history of civilization and especially the price man has paid, in restriction of freedom of personal action, for the greater benefits that have come with civilization. Since the psychoneurosis is largely a matter of point of view, it is necessary also to

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consider the history of medicine, especially of the development of man's point of view toward his sicknesses.

Back before the dawn of history disease was looked upon as of supernatural causation. The wrath of the Gods, punishment for sins, demoniacal possession and other mechanisms of magic were the only factors in etiology. This point of view persists in some guise to a considerable extent to-day. Hippocrates and his followers stressed the theory of organic causation in an attempt to rid medicine of magic. They have succeeded only partially and the materialists of a later day did almost as much to obstruct the proper understanding of man's illnesses as did the deists and medicine men of an earlier civilization.

The psychogenic idea was the direct descendant of magic in that it stood in opposition to the organic causation theory. In its birth with Paracelsus and later Mesmer (1734-1815) it was hardly distinguishable from magic. The early hypnotism was well mixed with astrology. Mesmer, however, held ideas about "imagination" as a cause of symptoms. With Charcot psychopathology began to take on more of the appearance of science and then evolved the concept that diseases could be either organic or functional in nature. The functional were those without demonstrable organic lesions. The term "functional" exists to-day hardly better defined than that, although it is becoming more and more to be admitted that most if not all of the diseases we call "functional" are psychogenic in origin. If those terms should eventually be proven to be synonymous the older one had best be discarded.

Following Charcot, the psychogenic theory has made mighty strides. Formulations have become more accurate with the clearer knowledge of the workings of the human mind. Most of all we owe to Charcot's most distinguished pupil, Sigmund Freud, the system of psychology which enables us best to understand those mental processes which make men feel sick.

To understand the psychoneurosis one must understand the general situation of the individual who feels sick. This

feeling of sickness, his interpretation of it and his fears about it are what urge him to seek medical aid. The essential thing is that he feels sick and the neurosis as it is presented to us is an explanation of his feeling badly. Symptoms become necessary as the need for the explanation becomes greater. If one can speak of the need for the neurosis, then the neurosis comes to be in some degree an asset. The individual must gain something by being neurotic. Admittedly he loses a great deal by the neurosis and often the asset value is difficult to determine. In the compensation neurosis and the litigation neurosis the hope of monetary recompense and the desire for revenge are easily understandable factors. In many of the others it is much less easy to appreciate, for often the asset is a purely personal one of self esteem in that the neurosis is an acceptable solution of the problem of the patient which consists of conflict between his instinctive life and a reality none too pleasant to face.

It is best not to speak of causes of the psychoneuroses for so many factors enter into the genesis of such a complex mental state that usually each can play a minor role of varying importance. One may better speak of determinants each one of which is but a partial cause. The principal determinants of the neurosis reside in the personality of the patient. Naturally this includes about everything that may have entered into the individual's development. Here we encounter his instinctive endowment—both the ego instinct and the sexual. Of importance also is his training and education, his methods of handling himself in regard to his environment, his methods of handling his instinctive trends and his opportunities for the release of instinct engendered energy.

Of all the instinctive trends those which have to do with the sexual are by far the most important in the majority of neuroses. Sexual motives and desires are not only extremely potent but also are the ones which must be most actively curbed in civilized society. Did sexuality consist only of propagation instinct and mating desires the prob-

lem would be relatively simple. But sexuality is complicated by its many side issues, partial trends, in the main, with a reality in the life history of the individual and bearing a burden of shame, not infrequently disgust, in the mind of the adult living, of necessity, in a world of customs and morals. These trends are grouped in the infantile sexuality for it is at that level that they arise and are partially organized. Among these partial trends are more or less erotic attachments to parents, brothers, sisters and others; masturbation desires and practices; anal erotism and a number of so-called perverse tendencies of major or minor importance. Their importance depends not only on the relative dynamic force of the wish behind them but the degree to which they have been assimilated into the personality and their ability to exist in the company of more adult, social and "respectable" motives.

Such as these are factors which exist in every life, and may remain, as latent personality trends under one group of living conditions but under others may become important determinants of a psychoneurosis. Over against the personality stands the life the individual has to live; and his degree of normality or neurosis depends on how satisfactorily he is able to adjust himself to his life, how near the middle line he can steer his course.

From such a survey of the psychogenic theory it becomes obvious how difficult adequate classification of the psychoneuroses is; as difficult as a classification of the human race. Nosological terms which seek to describe causes are almost always inaccurate. Such terms as "Traumatic Neurosis" applied to cases where compensation or litigation are also factors, are especially fallacious. One might as accurately call them "Compensation Neurosis." The trauma was a determinant only because it served to release the underlying more important determinants. The kind of trauma has very little to do with the neurosis. The kind of man who sustained the trauma is the all important consideration. The term "Post-Traumatic Neurosis"

while better, still leaves much to be desired. Other systems of classification based on the anatomical localization of symptoms are equally useless. They become unwieldy due to their own complexity and lose their theme in a maze of words. It must be admitted that no hard and fast classification is possible and that under any classification, borderline and mixed cases make up a considerable number of the whole; nevertheless that offered by psychoanalysis is by far the most accurate and practical. It deals with the mental states behind the symptoms and hence has the greatest etiological significance.

Freud divided the neuroses into two groups. 1, The Actual Neuroses and 2, The Psychoneuroses.

- A. Actual Neuroses
 - 1. Anxiety Neurosis
 - 2. Neurasthenia
- B. Psychoneuroses
 - a. Hysteria
 - 1. Conversion Hysteria
 - 2. Anxiety Hysteria
 - b. Compulsion Neurosis (Obsession)

According to Wechsler "The actual neuroses may be regarded as mixtures of psychogenesis and organic pathogenesis. They represent clinical entities in which regression plays a comparatively small part and the precipitating trauma the leading role. The conception is that an otherwise well adjusted individual sustains an accidental injurious experience by which the whole organism is, as it were, overwhelmed and more or less disorganized."

"The psychoneuroses on the other hand are the results of conflicts and regression to various points of infantile fixation. The neurosis represents an attempt at adjustment and one may see in it evidence of repair. The clinical manifestations therefore are colored by the restitutorial efforts and represent some sort of compromise formation between regression and adjustment."

Time permits of but brief description of these clinical types. Anxiety neurosis is the form most commonly seen.

Its outstanding factor is the anxious expectation. Its symptoms include a sense of vague but intense fear, feelings of impending death and dread of serious disease or insanity, palpitation of the heart, shortness of breath, dizziness, tremblings, feelings of faintness and all of the other symptoms of fear. The cause lies in the immediate sexual life of the patient; in situations where sexual stimulation is great and organic relief negligible or nil. This is the case in the "engagement neurosis" where courtship is prolonged and violent, in women whose husbands practice coitus interruptus or who suffer from *ejaculatio praecox*, in individuals where abstinence is enforced but can not be endured and a host of other conditions where the same general principle applies.

Neurasthenia, as the term has been restricted by Freud, is a very rare condition. Clinically it is manifested by general lack of energy, easy mental and physical fatigability, mild gastro-intestinal disturbances, feelings of pressure in head, neck and spine, and frequently impotence and low blood pressure. The main etiological factor is the opposite of that for the anxiety neurosis: an excess of the physical response in sexual life with little or an insufficient amount of the psychic concomitant. Hence it is seen most frequently as the result of prolonged or excessive masturbation, *ejaculatio praecox* and similar conditions.

Clinically the psychoneuroses differ from the actual neuroses very little. In clinical observation the latter merge gradually with the former and many states that have persisted for any considerable length of time are definitely borderline conditions. Often it is a matter mainly of degree. The difference is one of mechanisms not of symptoms. Hysteria is a method of handling tendencies and symptoms in an attempt to retain adequate contact with reality and make some degree of social life possible.

Conversion hysteria is a term employed to define psychoneurotic states where the neurosis is converted into physical symptoms. The psychological state accompanying

these symptoms is of utmost importance for the diagnosis as well as for the treatment although clinically the outstanding features are the physical symptoms. The hysterical personality with its infantile reactions to life and its inability to adjust at the adult level of reality lies at the bottom. The physical symptoms of conversion hysteria are multiplex. Hysterical pains, paraesthesias and anaesthesias; hysterical paralysis, contractions and convulsions; hysterical blindness and aphonia are but a part of the symptoms.

In the anxiety hysteria the anxiety dominates the picture. Back of it all is the same hysterical personality. Hence the anxiety hysteria appears as a thing much less in touch with reality than does the anxiety neurosis. There is much more of the infantile regression. Often however only very careful analytic study can establish the differential diagnosis.

The compulsion neurosis occurs at a much deeper unconscious level than does hysteria as the latter is deeper in its localization than the actual neurosis. The prime symptom is the compulsive idea—the obsession. The obsession may consist of fears, in which case the term phobic neurosis has been used, or compulsive acts or thoughts. Freud has described it as the “tabu neurosis.” The phobias and the ceremonial for handling the phobia make up the bulk of the clinical picture. One may, of course, apply terms descriptive of each individual phobia, “agoraphobia,” “misophobia” and the like and describe “hand-washing manias,” “touching manias,” etc., as separate clinical types but such attempts are not only confusing but futile. The clinical picture is less important than the person. The compulsive idea which forms the core of the compulsion neurosis is very similar to an insane delusion and differs from it mainly in that with the former considerable insight is preserved. The patient recognizes the unreality of the phobia in contrast to real things of life and its absurdity, but in spite of that he must react to it

in his compulsive way in order to attain any degree of comfort.

Such then in very briefest, are the clinical pictures of the neuroses. The hopeless inadequacy of this description proves the futility of attempts to classify them this way. The psychoneuroses are not clinical states; they are states of mind. Possibly there are no such things as the psychoneuroses; only is there psychoneurotic thinking.

GENERAL SURVEY OF VISCERAL NEUROSES*

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In every-day language and in our thoughts, we are accustomed to make a well-defined distinction between organic and functional diseases, and we perceive by this classification something of an evaluating judgment, the outlook of which is directed by the conception, which the physician and investigator have formed for themselves, or perhaps, to be more correct, which has become systematized in them upon the basis of their own organization as an integral part of their environment (Burron). The physician who views patients and diseases from the standpoint of objective changes gives or gave very little place in his conception to neuroses. On the other hand, there is the extremist who believes that every state of illness, as well as every organic change, issues from the mental state.

We undoubtedly know and also admit it theoretically and intellectually that this one-sided view is incorrect. We are not, however, always capable of freeing ourselves from our sentiments. Then there arises in the physician an internal conflict between the rational and sentimental consideration of that part of the environment which forms his field of activity. That is, there develops in him a condition which we also find at the bottom of neuroses, the conflict between life as it really is and as interpreted by our feelings (Burron).

If one therefore does not desire to become neurotic in the sense of neuroses, one must free himself from this evaluating judgment. This is the more necessary, since the patient, particularly in countries where social insurance systems are well developed, experiences still more markedly the effects of this evaluating judgment. There are not many people who commence the consultation with the diagnostic statement: "Doctor, I am a neurasthenic." The sufferer—and to this category in large measure belongs

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the neurotic—feels “his honor as a sick man” best justified, when he is characterized by the label of a high-sounding organic disease, preferably by one that is well known to him and to his world and which is to a certain extent well-established. Moreover, the patient very frequently understands the diagnosis “neurosis” to mean “hysteria.” As a result, he feels himself misunderstood, even insulted and attempts to obtain his rights at the hands of another physician. The term “hysteria” has, to be sure, almost completely disappeared from medical usage and thought. It is not necessary to note that neurosis has nothing in common with that which one previously termed “hysteria.”

The objective manifestations of neuroses, which can be established, concern all tissues and organs controlled by the neuro-endocrine system. It therefore follows that the custom to separate neuroses from the obviously organic diseases is not justified. Function is an energetic process, perceptible to our senses or to our inner life. All vital processes are bound up with the structure of the protoplasm, in other words, with the “morphe.” Inactivity in the architecture of the tissues and cells would signify an absence of function. Every function is accompanied by a change in the morphe. Because these reversible changes are still essentially unknown, there is not as yet an approximately complete science of these changes, but only the beginnings of a functional morphology.

A great number of symptoms in anatomical or manifest diseases depend upon functional changes, the connection of which with the anatomic substratum cannot always be clearly recognized, since those functional changes are, to a very great extent, influenced by other conditions. Mention need only be made of the dependency of pain on the time of day or night (for example, in fracture, periostitis and thrombophlebitis), of the seasonal periodicity of the symptoms of duodenal ulcer. We can also refer at this point to the interesting experience that a condition, anatomically so well-established

and localized as the muscular rigidity in Parkinsonism, can be overcome by emotions, such as enthusiasm and anger (H. Embden).

The presence of an organic disease does not exclude the existence of a neurosis. Indeed, quite commonly or very often, there are in organic diseases neurotic functional disturbances which influence and even essentially determine the clinical picture. Neuroses manifest themselves at first in qualitative or quantitative changes of the functions, dependent upon neuro-endocrine conditions. The great physician, Ottomar Rosenbach, who placed in the center of medical thought the functional method of observation, upon which all our functional tests are based, was the first to employ the term "vagus neurosis." Several decades later, during a period when one believed in a complete anatomical and functional separation of the vagus and sympathetic systems, neurotics were differentiated in regard to constitution as vagotonic or sympathicotonic. From this too far-reaching differentiation, von Bergmann retreated to the term "vegetative stigmatization." The connection with the physiological basis is perhaps best preserved when the less favorable regulation of the autonomic innervation is characterized as the state of neurosis and predisposition to neurosis. Because the regulating influences arise in good part from the endocrine system, the endocrine element is thus embodied in this definition.

The predisposition to neurosis is purposely considered with neurosis, for functional and somatic stigmata can be present in an individual who enjoys the full capacity of productiveness and a complete state of health, in other words, who is not at all neurotic.

In order that the neurotic disease become manifest there is necessary a mental occurrence, the analysis of which makes it clear why the neuroses appear largely as visceral neuroses. We have only very few sensations of the interior of our bodies, and most processes in the organs remain unknown to us. We are unable to gain

from our inner experiences a conception or a picture concerning either the activity of the intestines or the significance and localization of certain sensations. This veil, which nature has erected between the state of consciousness and the visceral occurrences, acts as a protective wall for the natural course of the functions. It is known and becomes particularly clear in dealing with neurotics that the attempt, caused by abnormal feelings, to describe the sensations arising from the intestines objectively leads to an accentuation of the functional disturbances.

The activity of the body interior normally brings into consciousness only common feelings (feelings of pleasure and displeasure). Accentuated or extraordinary sensations give rise to a feeling of disinclination, which in the form of depression or fear leads to an increased "listening-in" to a supposedly abnormal internal occurrence, and, as in Pawlow's experiments, to functional inhibitions which, like visceral ones, are dependent upon impulses, emotions and moods. The number of disturbing feelings grows automatically with the lowering of the stimulus-threshold of sensations as a result of the intercalation of reflection, brooding and fear. In the absence of experience, of potentiality for comparison, and therefore with the inability to give characteristic expression to his feelings, the neurotic attempts to present to the physician his abnormal sensations. The physician listens to him much less impatiently when he knows that this description is not a discharge of talkativeness but the outlet of a physiologically produced inability to express clearly unusual sensations.

Pathological sensations within the field of the spinal nervous system cannot have such a psychic influence. Here we can localize, render objective and control by eye and palpating hand the extent and basis of the sensations. The latter cannot therefore automatically acquire such an influence upon the inner life and cannot radiate in the central nervous system like the common feelings and sensations coming from within.

Goldscheider states that "the visceral neurosis reveals to the field of consciousness of the sufferer the otherwise hidden realm of the vegetative processes. The latter on coming into a state of consciousness produce quite an extraordinary, even deeply-moving impression which lead him to thoughts of vitally important and life-threatening events. The autoplasmic clinical picture, that is, the imaginative complex which the sufferer makes of his illness and which for him signifies the disease increases in its content, extent and depth, taking firm root and hold." The individual becomes affected with suffering and overpowered by the neurosis in the automatic vicious cycle.

People of a particular somatic and psychic constitution are afflicted with neuroses. Muscular weakness, limp posture, drooping facial features, flabby texture of the tissues, loose joints and wide joint-spaces, glaring eyes, rapid changes in the color of the skin and a tendency to mechanical or spontaneous dermatography, rigid arteries and cutaneous veins, tendency to perspire and to shed tears are the essential external characteristics of the neurotic constitution. Tendency to fatigue, to feel chilly and cold (cold feet, fits of shivering, goose flesh), increased requirement for sleep, which is restless and disturbed by nightmares and followed by an unpleasant awakening, nervousness, tactile and sensory hypersensitiveness, moodiness with a tendency to fear and depression are the subjective and psychic signs of a predisposition to neurosis.

One can assemble all these stigmata under the heading "irritable debility." Experimental psychology has characterized processes of this kind as "apparent increased excitability" (Fröhlich). It has also been shown that the smooth musculature, when subjected to cooling, fatigue, asphyxia, etc., experiences an increase of tone, a contracture, which is accompanied by a decrease of the inhibitory potentiality (Pawlow, Biedermann).

This increase in irritability is an apparent one; it does not signify an increase of productiveness. It goes for

in hand with a diminution of the stimulus-threshold of irritability and with the velocity of transmission of the wave of excitability, leading to an increased tendency to fatigue and premature paralysis (Fröhlich, Thörner). The striated muscles of warm-blooded animals also follow this law. The tendon reflexes can thus, as a result of fatigue, experience an intensification, which in the case of a neurotic already occurs in an increased measure after slight activity. The delayed return to the initial state of the muscle, clearly demonstrated experimentally, must necessarily lead to a decreased productive capacity. This return is a process opposed to that in which the basis for the chemical energy-change in a case of "chronaxie" of Meyerhof was measured by the decomposition of the muscle phosphogens (adenosin phosphoric acid). The ability to understand the chemical peculiarity of "irritable debility" or "apparent increased excitability" is advancing with the rapidly progressing knowledge of the chemical processes in the active musculature.

Individuals who are particularly predisposed by constitution or heredity are not the only ones to become neurotic. Conditioning circumstances and changes, which the bodily constitution suffers because of severe illness, undernourishment, etc., and which the mental state experiences through sorrow, worry and vexation—in short, as a result of the shocks to the inner life in general—can produce in every individual a neurotic state. Certainly, this develops the more readily the more marked the emotional predisposition and the weaker the will.

However, it must be very carefully noted, that the physician and the medical treatment can also act as factors in the origin of a neurosis. Thus, the diagnosis of a supposed cardiac defect in a child is not infrequently instrumental in making mother and child neurotic. Life centered around illness can force the character of an entire community, for example, a tuberculosis sanatorium or the family, in the direction of a neurosis. The diet neurosis, which leads to a degree of food restriction far

beyond all therapeutic need, is also quite common. The neurotic dietist seeks to convert others to his distorted views concerning the salubriousness and the curative properties of the food of his choice, and gathers around him, if the occasion should arise, a community of believers in his diet. The physician or healer, who propagandizes a one-sided fare as therapy or panacea upon grounds of prejudice and on over-estimated conception, which eventually becomes a catch-word, commits this to a greater degree. This prejudice and over-rated idea may even proceed from personal experiences; that is, from sensations and subjective feelings which, as in neurotics, have gained an influence, though incompatible with reality, upon his way of regarding therapy. As a result he brings about more unrest and confusion than help.

In the same way that a neurosis can arise through internal predispositions and external influences, so is also the choice of the organ dependent upon these two factors. Undoubtedly, there are families in which a single (definite) organ or organ system has, by heredity, a particular predisposition to become diseased, and also functions without external cause as a neurotic end organ. But frequently external factors play a role in the choice of the organ. In this fashion the organ-neurosis becomes bound up with organic disease. Should a member of a family die of carcinoma of the stomach, there may arise a phobia of gastric complaints in other members of the family. In other words, the choice of the organ is also dependent upon accident and is variable.

The visceral neurosis manifests itself mostly in states of irritability, in (apparent) increases of function, and leads to an abundance of symptoms, which, according to the end organ, belong to the sensory, motor, secretory or incretory sphere.

The tactile and sensory hypersensitiveness is of paramount significance for the understanding of all neuroses. Goldscheider has established in many individuals latent

hyperesthesia and hyperalgesia of the integument of the body, recognizable by the painfulness of the physiological points of pressure. E. Libman has taught us that the degree of sensitiveness to pain can be evaluated from the painfulness to pressure applied between the mastoid process and the ascending ramus of the mandible. Head's zones, present in cases of visceral pain, have again been recently studied by the von Bergmann school. According to von Bergmann, the visceral-sensory reflex of Mackenzie travels by way of sensory sympathetic and vagal fibers into the spinal system. According to Goldscheider, common sensations arise in the following way—that through a summation of stimuli, a state of increasing irritability is brought about; moreover, in order that sensations arising from internal organs come into a state of consciousness in another form than that of the common feelings, such as pain, pressure, fulness, cramp, an increased sensitivity or an augmented organ activity (such as strong heart beat, increased peristalsis) is necessary.

The increased sensibility of an individual predisposed to neurosis is recognizable not only by the nerve pressure points and Head's zones, but also, in large measure, by abdominal tenderness, which concerns exclusively the abdominal aorta and the iliacs and forms an inverted "Y." It manifests itself further in a very characteristic and a very precisely localized tenderness of the musculature, and is objectively palpable and recognizable by the local contraction of the areas of applied pressure. It is indeed an accomplishment of therapy when at the time of examination one can tell the patient who is in no way able to express his sensations in a recognizable form, exactly where the pain is localized, and, in addition, if he can be convinced that, for example, the heart pain, with which he is troubled, does not concern the heart but the chest and intercostal muscle.

The hypersensitiveness involves not only the tactile system but also affects the other sense organs. There are constantly and periodically found in these individuals

a hyperacute sense of hearing and of smell, everywhere, at home, on the street, in the auto and in hotels, unpleasant disturbances, less frequently the shunning of light. This frequently occurs in women during menstruation, which represents a critical period for the manifestation of the neurosis.

Under external influences, particularly also under the influence of emotions and moods, these latent symptoms of pain neurosis can develop spontaneously in the most manifold manner into a state of suffering. There is no organ or region of the body where pain cannot appear. Particularly frequent is the headache localized in the back of the head and neck, from which Quinke assumes for its origin a vasomotor secretory increase of cerebrospinal fluid formation, in other words, a dependency upon an angioneurotic hydrocephalus. Abdominal pain and pains, characterized as rheumatic, are also frequent. On questioning these people whether they have ever suffered from sciatica or lumbago, one very frequently receives an astonished but affirmative answer. On the basis of very many observations, I agree with Goldscheider that much of that which is characterized as "rheuma," neuralgia, myalgia belongs to the group of pain neurosis. If this were recognized, one could help many sufferers better and more cheaply than by keeping these individuals from work and by sending them to rest-cure and watering-places. One should delete the term "rheuma" from medical usage, and thereby attain the diagnostically clear differentiation of the enormous number of patients grouped under this heading, but who have nothing more in common than pain. Furthermore, the "rheuma investigation," for the organization of which much energy and means are expended, should clearly express whether it is to serve the arthritides and the afflictions belonging to this class, or is to be directed generally against the extinction of pain, which in great measure depends upon pain neurosis.

There is some justification for the assumption that neurotic pains depend upon the painful contraction of smaller

arteries or upon a change in the muscular substance. The study of cramp in the calf of the leg shows that there is a type of muscular rigidity which, in contradistinction to the state of contraction, to the so-called increased tonus and rigor, is accompanied by very marked pain.

Neither do I doubt that the smooth musculature is capable of analogous, varying changes of state. Thus, the hypertonus of the smooth musculature of the blood vessels, which can be produced experimentally with adrenalin, takes place entirely without pain, while angiospasm, as experimentally induced with barium salts, is extremely painful. The difference between both these motor processes of the vessel musculature follows also from their different pharmacodynamic influences. Only angiospasm, never hypertonus, reacts to nitrites, purin derivatives and papaverin. The question whether the pain produced by angiospasm depends exclusively upon a local ischemia is indeed to be answered negatively, since similar manifestations occur also in the veins, the pathology of which, to be sure, is still very little known, but the painfulness of which is demonstrated by the clinical picture of venous thrombosis. Angiospastic vascular crises, attacks of angina pectoris, etc., sometimes appear in those predisposed to neurosis.

At this point mention should be made of the relationship of migraine to the visceral neuroses. Migraine is not merely headache, and still less is it one-sided headache (hemicrania), but like visceral neurosis manifests itself by attacks of pain, which in addition to the head, involve the intestines and striated musculature; moreover, there are sensory and psychic equivalents. I do not therefore believe that the conception of an increased formation of cerebrospinal fluid as the basis of an attack of migraine is correct or represents the entire truth. Migraine, considered in the light of an angiospastic diathesis, is best able to explain the manifestations; phenomena in the veins, sometimes observed during an attack of migraine, support this belief.

Migraine and visceral neurosis have in common an angio-spastic tendency. The sufferer from migraine exhibits the same hypersensibility as the neurotic individual. Nevertheless, it would be incorrect if one were to compare migraine with the visceral neuroses. The difference lies in the fact that the tendency to migraine, more outspokenly transmissible than any other trait, very often in earliest childhood, without either external or internal causative factor, emotion, fear or introspection (in the interior of the body), becomes manifest like a flash of lightning out of the clear sky.

In whatever manner the visceral neuroses may manifest themselves, they never lead to the typical clinical picture of an attack of migraine with aura, headache, scintillating scotoma, vomiting and subsequent diuresis. In my opinion migraine represents an independent, sharply-defined, morbid process, recurring for years, chiefly during childhood, in an almost monotonous manner. However, because of the many points of pain localization presented by the hypersensitive state, and as a result of the emotional status, which characterizes the psyche of the individual suffering from migraine, many symptoms and manifestations of visceral neuroses appear later in some of these patients—that is, the predisposition to migraine prepares the soil for a neurosis.

Associated with the spastic pains in the vascular musculature and the reactions in the striated muscles, as yet not so well founded, muscular symptoms of the intestinal tract, the bronchi and the urinary system are present as additional elements of the visceral neurotic manifestations.

Though the allergic factor as a fundamental basis for bronchial asthma can little be questioned, it is also certain that the same symptom-complex can occur by way of a psychoneurotic route. Perhaps the etiological difference is only an apparent one, brought about as a result of our ignorance. One must take into consideration that

active proteinogenous bases arise in the tissues, which have the same effects as allergens. This is also the case with urticaria, which like bronchial asthma rests partly upon allergic and partly upon psychoneurotic foundations. To this group also belongs mucous colitis, the colonic manifestation of visceral neurosis, which, like asthma, shows besides the spasm of the smooth musculature an abnormal secretion, an additional neurotic resultant element.

The complicated morbid motor processes in the gastrointestinal tract, arising in visceral neurosis, are thoroughly dealt with by the specialists in connection with the anomalies of secretion in this cycle, and need only therefore be mentioned here for the sake of completeness. The same applies to "cardiac neurosis."

Within the limits of this general survey we will now direct our attention to those neuroses in which a single organ does not occupy the foreground but in which, to the same extent as in Basedow's disease, a greater number of objective symptoms form a clinical picture, the contents of which vary from case to case. In its entirety it is very impressive and therapeutically much more difficult to attack than the organ neuroses.

As an example, I quote the case of a patient who visited our clinic four times during the last eight years. In 1921 the patient, then 32 years old, strong and healthy-looking, stated that he had been a healthy child. While at the front he suffered from dysentery, and as a war prisoner in Russia from malaria, scurvy and hunger edema. Since 1919 he had palpitation and attacks the description of which correspond with that of angina pectoris. The examination revealed nothing unusual. A diagnosis of "cardiac neurosis" was made. After three years he returned with the same symptoms. The ward physician arrived at the following epicrisis: "The patient is a neurasthenic with a very labile vascular system. His hyper-irritability is aggravated by his war experiences, indeed still more by his poor working and social conditions. With short inter-

ruptions for the past three years he is suffering from cardiac and vascular pains. The pension granted him because of his "cardiac neurosis" is, to be sure, an additional factor in accentuating his apprehension concerning his illness. The prognosis of the pain is not very favorable, because it is primarily functional. Perhaps an improvement of his living and working conditions will bring him the necessary mental rest and with it relief." This prediction was fulfilled for some time. After four years, however, the patient returned with the same coronary complaints. He presented now an essentially changed picture:

Pale pasty skin, enlarged pupils, profuse perspiration, moist hands and feet, dermatography, small and feeble heart, a greatly varying blood pressure with a tendency to elevation (155-95 mm. Hg), whereas previously hypotonia predominated, attacks of diarrhea with normal gastric juice, slight glycosuria, a basal metabolism within statistically normal limits, good specific dynamic action.

The belief that we were dealing purely with a case of psychoneurosis now became certain. The patient was readmitted one-half year later. Regular morning and evening measurements of the blood pressure ranged between 128 and 190 systolic, while the diastolic varied between 80 and 120. The pulse-rate fluctuated between 90 and 130. At this time also glycosuria was occasionally observed, the blood sugar and sugar tolerance test being normal. The blood sugar curve after an injection of adrenalin revealed normal figures. With the injection, however, the patient experienced sensations similar to those occurring during his attacks. Loewy's pupillary reaction was positive. The administration of ergotamin relieved these symptoms. The ward doctor, possessed of some imagination, reasoned on the basis of this finding that the manifestations might depend upon a hyperfunction of the adrenal system, and brought up for discussion the question of the extent to which the old but not completely healed

dysentery might be held accountable for the origin of the neuro-endocrine disturbances.

However that may be, and to whatever extent external conditions might have influenced the development of this disease, this example illustrates perhaps more clearly than any attempt at a systematic presentation how a visceral neurosis can produce clinically impressive and prognostically serious appearing disturbances.

The glycosuria, frequently observed in such cases with and without hyperglycemia, appears generally to take a benign course. I cannot express anything prognostically conclusive concerning the high arterial blood pressure appearing in neurotics during attacks and often apparently conditioned by the emotions. I have not as yet observed it to result in primary contracted kidneys, very often found in migraine. In other cases the transition from visceral neurosis to the important endocrine diseases proceeds in the direction of Graves' disease.

Neurotics occasionally also show an increased respiratory rate and over-ventilation, as a result of which neuromuscular hyper-irritability and tetanic attacks (respiratory tetany) appear. One should investigate to what degree there exists a connection between the increased reflexes, muscular irritability (idiomuscular swelling), perhaps even the manifestations in the smooth musculature and the ionic equilibrium. The latter in cases of visceral neurosis, can be altered not only by respiration but also by an abnormal HCL-production of the stomach, and as we shall soon consider, by the formation of an abnormal urine. F. Mainzer has analyzed in our clinic a case of neurotic respiratory tetany. He found a decompensated alkalosis in the blood; the hydrogen ion concentration and ammonia content of the urine, as well as the total acetone excretion, similarly indicated the condition of alkalosis. It followed that psychic excitement led in this case to an increase in the hydrogen ion concentration and in the total acetone excretion, even when an

over-ventilation, as measured by the number of respirations, could not be confirmed. Accordingly, one must bear in mind that part of the alkalurias (phosphaturia), which can be present as an objective symptom of visceral neurosis, depends upon an alkalosis resulting from over-ventilation.

But certainly this does not hold true for all cases. Another group depends upon the following mechanism—where too great a quantity of very acid gastric juice is eliminated, a visceral neurotic reaction, an alkaline urine is formed in order to regulate the neutral state.

There is a third type of phosphaturia due to a nervous disturbance of kidney secretion. On a mixed diet of the omnivora, the formation of an alkaline urine would signify a considerable loss of fixed cations (sodium, potassium). The general ionic equilibrium in these cases is maintained by means of an increased formation of ammonia on the part of the kidney. Therefore, we have under these circumstances the very peculiar urinary finding of an alkaline reaction and high ammonia content.

That some of the cases of phosphaturia are primarily of renal origin is demonstrated by the fact that phosphates, mixed with urates and oxalates, appear in the sediment, or that sediments of different chemical composition alternate at rather short intervals.

There are people who bear the stigmata of neurosis and whose complaints consist solely of attacks of pain very similar to those of urinary lithiasis. At quite short (half-hourly) periods during the attack, we have observed in such cases this change in the urinary sediment and urinary reaction. During one such attack a urine of gelatinous consistency was excreted, which, I believe, has the same genesis and significance as orthostatic albuminuria, that is, an elimination of albumin and albumin (colloid) precipitating substances. The existence of a psychic albuminuria has been known since the time of Senator, and has been confirmed by many individual

and group examinations. Erich Meyer and Jungmann have shown that orthostatic albuminuria, the basis for which probably lies in vasomotor neurotic and psychic lability, is very strongly dependent upon nervous (psychic) influences.

Marsh-hemoglobinuria, which attacks individuals only of easily excitable vasomotor constitution, is closely related to orthostatic albuminuria.

Rosin reports severe vasomotor disturbances in people who have suffered from paroxysmal hemoglobinuria resulting from exposure to cold. One of his female patients declared most decidedly that she had attacks also after fits of anger.

Hemoglobinuria and hematuria may occur alternately or combined. Moreover, the hematuria is (probably as a result of a congestive vulnerability of the kidney vessels) in many cases not independent of psychic factors. For example, Latour observed a female patient who, whenever excited, eliminated bloody urine, a phenomenon which indeed belongs to the group of hematurias as seen in individuals in religious trance, etc. The relationship of neurosis to hemoglobinuria, in other words to blood destruction, occurs again in acute porphyrinuria, which chiefly attacks individuals of labile psychic-nervous constitution. Günther cites fear as the exciting cause in one case.

In this manner the connecting threads of neurosis can be elaborated in much detail. Psychic or neuro-endocrine influences upon the functions of the organs and tissues confront us everywhere and demand a synopsis and synthesis of the results of psycho-analysis and patho-physiological research.

INSOMNIA AND DISTURBANCES OF SLEEP *

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The experimental evidence concerning this difficult subject of sleep is so meagre and the theories so numerous, that I will at first confine myself for practical purposes to a short enumeration of them. The following are the outstanding theories:

The controversy now in the foreground: Is there a particular cerebral center, such as a number of authors have located in the neighborhood of the third ventricle, especially in view of certain observations made in encephalitis lethargica; or does sleep merely originate from a process in the cerebral cortex without assuming the existence of any special sleep center? In this controversy we hear the contradictory opinions of Mauthner, Trömer, v. Economo, Goldscheider, Nachmansohn, Haberman and others. Some of them consider sleep and its disturbances rather as physiological phenomena, others as more or less psychological ones. The following points of controversy play an important part. Can one sleep without being tired? The sleep of infants is mentioned here as an evidence for different theories. Or is fatigue a necessary factor for the origin of sleep? Every medical practitioner must decline to be involved in this controversy, but he must demand that the theorists should at least investigate the sleep of infants, which throws light upon many problems.

I shall later present the new viewpoints which a knowledge of infant sleep and its disturbance is capable of disclosing to us, information which indirectly may also be useful to us in dealing with disturbances of sleep in adults.

Let us consider the matters in disturbance of sleep which interest both physician and patient much more than sleep itself. If sleep is satisfactory, the patient will pay little

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or no attention to it, any more than in the case of the other normal functions of his organs. In such cases, the patient is indifferent to the physician's questions as to sleep and meets them with a certain amount of astonishment, as we practitioners experience every day. If, however, there are or have been irregularities in either quantity or quality of the patient's sleep, these disturbances are, as we all know, equal to the most cruel and torturing sufferings which it is possible for a patient to undergo. In these, to mention an important point at the outset, the subjective sensation is stronger than the objective injury.

The same theories were invoked to furnish explanations for disturbance of sleep as for sleep itself. Excitation, suspension, interception, conditional (disturbed) reflexes, intoxication, dyscrinea, psychology and psychoanalysis, all these were experimented with to explain the disturbance of sleep. However, as already explained, sleep is not a monogenetic function, it is not possible to explain the disturbance of sleep by any uniform rule. Not even the most captivating theories are adequate, and above all, they do not help us medical men in the least in the treatment of these complaints. We cannot develop diagnostics and therapeutics on theories alone, but on the other hand, we must take care not to indulge in purely symptomatic diagnostics and therapeutics. It behooves us to be convinced that every individual case of disturbed sleep must be examined and treated separately on its merits, and solely for the purpose of facilitating diagnosis and treatment. I have felt impelled to compile a certain typology of the various forms of disturbed sleep, as observed, treated and tabulated on the basis of my experience in the hospital and private practice. Of course, these types can only be applied to certain groups, although these are the chief groups. I have already said that the investigator of sleep and insomnia must pursue these studies with children and infants. As a matter of fact, in children the attendant conditions are still relatively clear and not so complicated by a thousand and one external influences

as in the case of adults. I have therefore pursued my own studies with children of all ages.

First of all, to explain what we really mean when we use the two terms "insomnia" and "disturbance of regular sleep." As regards "insomnia," there is in fact practically no such thing as absolute insomnia. The results of the well-known experiments with dogs in which the dogs died after they had been kept awake artificially for several days (Manaccine, Legendre and Pieron Nach Nachmansohn) can be applied to man. In so far as we know the catastrophic effect of prolonged insomnia upon physical health is from occasional observations and from the study of encephalitis lethargica. "Insomnia" therefore can only be relative if sleep is reduced in quantity or for a certain period of time, namely a night, may be absent altogether. For we know from practical experience, that the patient's complaints that "He has not slept a wink for weeks" will not stand the test of closer investigation. Perhaps it would be better, at any rate more accurate, to speak of "disturbance of quantity of sleep" instead of "insomnia" as by so doing we not only include abnormally reduced but also abnormally prolonged sleep, although the latter is generally of lesser practical importance. On the other hand in contrast to these disturbances of quantity, we have the disturbances of quality. The nature of lighter or deeper sleep is the connecting link between quantitative and qualitative disturbance. Here we must keep before us the general normal diagram of sleep (Kohlschütter, Ebbecke, Czerny, Karger, Aron), according to which the curve of sleep shows the rapid decline of excitement during the first hour of sleep, on the expiration of which sleep attains its greatest depth, and then gradually decreases in intensity. Qualitative disturbances of sleep assume various forms such as interruption, changes in periodicity (*typus inversus*), abnormal position of the body, *pavor nocturnus*, screaming, nocturnal shaking of the head, certain forms of enuresis, nocturnal convulsions and others.

It would be interesting to make a special study of the

sleep of the prematurely born, since according to Doxiades, the prematurely born show particular fetalistic signs, especially with respect to the cardiovascular and the nervous systems. Until now, unfortunately, most papers on the prematurely born including those published by several workers—Dollinger, in our Kaiserin Augusta Viktoria Haus—do not deal with the sleep of the prematurely born. Doxiades in the course of his capillaroscopic investigations of prematurely born infants has discovered defects in development of the capillaries similar to Jaensch's archicapillaries.

In 80-85 per cent of prematurely born infants Doxiades found archicapillaries compared with 8 per cent in normal new-born infants and the finding of these archicapillaries in infants between the ages of 6 months and one year together with other abnormal conditions in the cardiovascular system has led to the discovery of a new constitutional form which Doxiades has called "Fetalism."¹

I have elsewhere described psychic and physiological behavior of these fetalistic infants which is most interesting, and is distinct from that of psychopathic children on the one hand and of mentally normal children on the other.

It was necessary for me to make a few remarks concerning certain data taken from the new capillary discoveries and their interpretation, in order to create a basis for the following remarks on the tabulation of types of disturbance of sleep which I propose to discuss. The classification is partly based on capillaroscopic discoveries. Additional information on my views on capillaroscopy will be found in the monograph published by Doxiades and Pototzky^{2 3 4} which by the way, differs in several essential points (for instance in the conclusions formed as to the connection between capillary form and thyroid gland hormone) from the customary views held by Jaensch and his collaborators.

In presenting to you now my typology of disturbances of sleep in connection with our capillaroscopic discoveries.

I must impress upon you the fact, that these results which I have not yet published, are now being presented for study and investigation.

The types of sleep disturbances are based upon insomnia and sleep disturbance in infants. In our discussion we shall omit all exogenous elements such as infection, poisons, acute physical and psychic injury, which are responsible for acute disturbances of sleep only.

We now arrive at a classification or typology of disturbances of infantile sleep which aims at determining the particular fundamental constitution type for every form of sleep disturbance, the latter being merely symptomatic in nature, a procedure similar to that which I adopted and described on a former occasion when compiling a classification of enuresis.⁵ We shall later return to a consideration of the sleep disturbances of adults.

We must, therefore, in sleep disturbances, distinguish the following fundamental constitutional types:

1. The neuropathic (vasoneurotic)
2. The psychopathic
3. The fetalistic
4. The pathological endocrine or pathocrine

I have carefully investigated 106 cases of disturbance of infant sleep along these lines, the majority quite recently, during the last six months, when—as in the case of practically every nervous child—I employed the capillaroscopic method of investigation. Thus, for example, from January 1st to June 30th, 1929, that is during the first six months of this year, I investigated 53 cases of infant disturbance of sleep in my own practice. I shall not discuss all the cases of insomnia which I treated during the eleven years of my tenure of office as director of the Policlinic for nervous and difficult children in the Kaiserin Augusta Viktoria Haus, a hospital for children. As I have only employed capillaroscopy for the last three or four years, even during that time and especially quite recently, I have most

carefully investigated 53 cases of disturbed sleep in infants, which I am including in our discussion.

In adults, among whom, during the last twenty-five years, I have treated a very great number of cases of insomnia, I have felt obliged to refrain from calling in the aid of capillaroscopy, as I found the capillaroscopic signs and indications too unreliable, owing to the manifold changes and transformations which the vascular system of the adult has already undergone.

So far it has only been found possible to deal capillaroscopically with neuropathic (vasoneurotic), fetalistic and pathocrine children, and consequently their sleep and insomnia, whereas the psychopathic children are only to be got at "per exclusionem," as they do not show any special capillaroscopic indications. To-day, the term "psychopathic child" and all it implies is a term much too often employed in a general way, which has been greatly restricted in its scope, thanks to capillaroscopy, as among the so-called psychopathic you find many neuropathic, fetalistic and pathocrine children. It is especially in this elimination of the idea of a psychopathic infant, that I am inclined to find a very special, in fact, the greatest merit of capillaroscopy. Of course frequently enough we shall encounter mixed forms, for instance combinations of neuropathic and psychopathic types, but we cannot enlarge upon these now. Needless to say, when considering the treatment to be employed it is necessary to give due consideration to these mixed forms.

Let us now briefly consider the various fundamental types, their capillaroscopic features and finally the nature of disturbances of sleep as such. We shall then have to ask ourselves whether certain symptoms as seen by us in disturbed sleep must rightly be regarded a characteristic of any one fundamental type.

1. The neuropathic fundamental type, is the type in which we are able to determine the existence of a general reflex hyper-sensitiveness to excitation, unusually powerful

reflexes, dermatographia and in a certain sense also the facialis phenomenon, and above all the vasoneurotic component now more clearly revealed to us by the capillary picture. To this type belong the children who suddenly turn pale and equally suddenly blush furiously, and on the other hand suffer from cold hands and cold feet. To this type also belong the children who, owing to constant changes in circulation are subject to attacks of nervous headache, fainting spells, perhaps also umbilical colic and other spasmodic vasoneurotic attacks. Capillaroscopically these children show a condition of pronounced vasoneurosis, the venous capillary branches are congested and we often see in them a granular stream, which in severe cases can be traced to the congested plexus. In special cases we find a paradoxical change in the direction of the current of blood flow. The capillary loops often disappear entirely then reappear, in short we see an ever changing picture, which in part it is possible to record photographically by capillary microscopy. The capillaries themselves are normally formed, that is to say the neocapillaries, but frequently their peduncles are distorted and flagelliform.

2. The psychopathic fundamental type, in which I include the hysterical as a sub-type, embraces children suffering from disturbances of will-power. Here we find that (a) the interference is abnormally powerful, shy, frightened, cringing children or (b) the interference is abnormally weak, unsteady, restless and violent children, in short children lacking self-control or restraint. As already mentioned in these cases, the capillary picture gives us only indirect information by negative results.

3. The fetalistic children represent a very peculiar psychological picture. The chief trait to be observed in their character is amoral mentality, a psychic disharmony, frequently side by side with a physical disharmony.

This is the type of children, who often without being in any way mentally defective, will yell at the top of their voices, smash up everything they can reach, act impulsively

without any apparent motive, yet without showing any mental defectiveness.

On the other hand, however, although otherwise quite up to the standard of education, they are absolute failures in some particular function, mathematics for example.

The parents are at a loss to know what to do with children of this type, everything they do is so abnormal, irregular, and so unexpected. In some respects the child is advanced for its age, precocious, and in other respects it is a year behind. These children have been the victims of a disharmonious interruption in development, certain features of development have, as it were, been retarded, a fact which is indeed disclosed capillaroscopically. Archicapillary forms, that is to say, forms which are retarded in development, have extended laterally instead of vertically, and hypoplastic forms which, instead of the normal elongated loops, only show short, as it were rudimentary, portions of loops. From the condition of the archicapillaries of the periphery one may infer that the ganglionic elements are likewise in a fetal state (Vogt).

4. The pathocrine type is included in the table here with the others merely for practical reasons, but is in the more severe forms, cretinism for example, clinically rather more closely related to the types of mental diseases. The forms frustes (for instance those with myxedematous basis) which very often we are only able to recognize capillaroscopically, are so frequently diagnosed as neuropathic or psychopathic. Capillaroscopically we see in these cases a most remarkably transparent corium and very severe congestion, especially in the region of the subcapillary plexus. More details will be found in the papers of Doxiades and Pototzky² on the capillary changes in myxedema and mongolism.

We now come to disturbances of sleep in its manifold forms, and their relation to the different types enumerated.

It should be clearly understood at the outset that individual forms of sleep disturbance as such can only be

judged symptomatically; only isolated forms are pathognomonic for certain types. Thus we find such disturbances as belated falling asleep and premature awakening, restless sleep such as talking in the sleep, screaming and awakening with a start (*pavor nocturnus*), somnambulism, dreaming, are common to all types. On the other hand, there are certain characteristic special forms. It would appear, for instance, that certain forms of fear are relatively more frequent in fetalistic than in vasoneurotic patients. Then again the shaking of the head (*jactatio capitis*) is a form which, according to my observations and also confirmed by capillaroscopy, is especially prevalent in fetalistic, and not nearly so frequent in pathocrine, neuropathic and psychopathic children. This "*jactatio capitis*" is, as we know, often found in the newly born, and persists frequently enough to the age of puberty. Perhaps we are here confronted with a disharmony, a disability to maintain the "tone" of the body, as first observed in the new-born babe. At any rate, this peculiar complaint is especially evidenced in fetalistic infants as shown by capillaroscopy. Whether or not this "*jactatio capitis*" is closely related to "tics", as we have hitherto assumed clinically (Homburger)⁶ is a point upon which perhaps future capillaroscopic research will furnish information.

The abnormal depth of sleep so frequently shown by children subject to enuresis is a feature especially prevalent in psychopathic patients. These are children who are quite indifferent to bed-wetting. Children who wet the bed because they are restless and awake frequently during the night, but always wet, generally belong to the neuropathic group.

Just a few supplementary remarks upon the sleep of the epileptic. The occurrence of convulsions during sleep and the deep sleep which follows the convulsive seizure cannot be regarded as absolutely pathognomonic for the epilepsy, inasmuch as these may be noted at times in convulsions of functional origin. In disturbance of sleep connected with masturbation we find—as with onanists gen-

erally—by capillaroscopy, that the vasoneurotic features are by far the most prominent, but we also find the masturbator represented in all the other groups.

To my mind the chief value of this classification of sleep disturbance lies in the fact that it renders possible the differentiation of causal therapeutics. Each group has its own therapy but we must not forget that mixed cases belonging to more than one group will require a corresponding combination of methods of treatment. In general the simpler the treatment the greater the success one may expect to achieve. The child is more impatient than the adult when the treatment is frequently changed and will not always coöperate with the physician. Therefore the treatment to be adopted in the case of a child must be carefully thought out in advance, but once having been determined upon should be carried through firmly.

THERAPY

1. In the neuropathic (vasoneurotic) child the first thing to be done is to regulate the circulation.⁸ For this purpose I have found calcium preparations to be the most suitable. Calcium taken internally for some considerable time has an unmistakable effect upon the circulation, as can be confirmed capillaroscopically. I administer the drug in the following form:

Tribasic calcium phosphate, 10.0.

Calcium citrate—Calcium lactate ad 20.0.

The amount which will cover a dime one to four times daily.

This medication has a definite and unmistakable effect upon hypersensitive children. It is only very rarely that I find it necessary to add small doses of bromide temporarily, and also very rarely adalin or luminal. In addition to calcium, vitamin drugs (radiostol) may be tried. To pacify the patient after an attack of convulsions I use chloral hydrate in the customary way. In the case of deep

sleep in patients prone to enuresis, sleep which might prevent the patient from perceiving that the bladder is full. I use camphor in small doses.⁹

2. In dealing with psychopathic children the most important thing is the psychic treatment. It is first of all necessary to determine the psychological sources responsible for the disturbance and secondly to determine in which way constitution and environment have contributed toward the etiology. Experiences, surroundings, mistakes in education—all these may have played a part. It may be sufficient merely to place the child in a different position, to rearrange the lighting of the room, or to separate the child in the room from his or her brothers and sisters, or from unsuitable nurses. In other cases it will be necessary to resort to more drastic methods to effect a change in surroundings, and to have the child treated by psychotherapeutic measures. The latter may be of a curative pedagogical nature, but may according to the particular case, lead up to energetic medical suggestive measures. In this connection we have a variety of methods of treatment which have to be adapted to the particular case at hand.

Allow me to describe a case from my practice. I was called by a colleague to see a little girl 10 years of age. This child had been in the habit of waking with a start at eleven o'clock every night for the past 6 months. She would run screaming into her parents' bedroom complaining of abdominal pain. It always took some time to pacify her, whereupon she returned to bed and gradually fell asleep. The family physician and the parents gave me the history while the girl was out of the room. The child had already been treated several times for her complaint. On further questioning it transpired that six months previously the child had spent a holiday with her parents in a small mountain village. There this somewhat spoiled child, used to more civilized surroundings, had on account of the primitive and often dirty toilet, acquired the habit of withholding its stool. The consequence was practically chronic constipation, accompanied by pains in the bowels.

which did not set in until late at night and awakened the child out of sleep. On the family's return home the child's daily motion became regular again, but the disturbance of sleep continued. I examined the child, talked to her without going too much into details, and soon found out that she was very intelligent but inclined to be suspicious of the physician. That was the reason why the drops formerly prescribed by other physicians had no effect. From the facts I also drew the conclusion that a prolonged course of suggestive treatment—and that was the only course worth considering in view of the fact that the trouble was six months old—was not suitable for this child. As it was necessary to act quickly I told the child that she would soon be well again, that I would stretch the sick stomach, and that she would then be able to sleep comfortably. I then pretended to stretch the skin of the abdominal wall. The entire "operation" did not last much more than half a minute. The mother asked me how many more calls I should have to make to complete the cure. I told her that there was no need for me to call again. The child was cured after this one "operation," and remained fit and well. I report on this case at length in order to demonstrate the fact that it is also possible to effect cures by sudden surprise methods. I must admit, however, that this method should only be adopted in cases of absolute necessity, as in the event of failure the chances for other measures are much more unfavorable in a child of this type. I am also aware that my judgment and method of treatment of such cases is not in accordance with the views of many psychotherapists, especially psychoanalysts; I know they would prefer a prolonged or "more thorough" course of treatment, but in psychotherapy it is necessary to decide upon the most practical individual method best adapted to the particular case at hand. Theorizing is of no use whatever, and I have no intention of binding myself to any one particular doctrine of psychotherapeutics; my aim is to extract from each doctrine that which at the psychological moment my experience and my instinctive

feeling, prescribe, neither giving preference to any particular one nor condemning any other.

For other types of children suffering from disturbed sleep and in fact for other nervous children generally the "Milieu Suggestive Method"^{10 11} described by me will be found suitable. This method consists in transporting the patient into surroundings agreeable to him, not actually but by suggestion. In such an attitude of mind the patient will be found much more amenable to the physician's orders. Experience has shown that this method is a good one for children also. With children lacking capacity for concentration I have, in certain forms of disturbed sleep, found the "psycho-gymnastic exercises" very useful, which I have collected and published in a little book entitled: "Concentration Gymnastics"¹² for nervous and inattentive children. It is however advisable not to resort to these exercises, nor in fact to most measures shortly before bedtime, but earlier in the day.

I have lately given up hypnosis almost entirely as I am able to manage without it and I endeavor to attain my object with simpler methods, particularly with children. For this reason when treating children suffering from disturbed sleep, I resort to rigorous measures only in cases of absolute necessity, to such remedies, for instance, as a complete change of surroundings, removing the patient to a strange house. There will, of course, be cases in which such a drastic remedy will be necessary.

3. In the case of the fetalistic child we shall have to confine ourselves to efforts to promote development with vitamine preparations, as according to Doxiades' and Pototzky's views archicapillaries cannot be transformed into normal capillaries by means of drugs, be they organic preparations or any other kind. We have, therefore, in such cases for some time past been using radiostol, and we think that we can really see a certain improvement in physical and mental development. It is, however, impossible as yet to say anything absolutely definite on the subject. Pituitary preparations (anterior lobe) may be tried.

4. For pathocrine children the advisable method will be to administer organic preparations, giving due consideration to the type of fundamental disturbance to be treated. Thus, for example, we have obtained successful results with thyroxin in myxedema and certain forms of mongolism. Also with hypophyseal preparations—thymus—and other preparations in certain types of pathocrinea. The most effective organic preparations of all appear to me to be the thyroid gland preparations, of course in cases appropriate.

Friedjung¹³ is quite right when he exhorts us, in cases of disturbance of sleep, always to throw light upon the psychological situation, such as the removal of a beloved person from the bedroom, which may provoke a disturbance of sleep, and Hamburger,¹⁴ too, is right when he stresses the injurious effect of an irrational mode of life upon the sleep of children of tender age. It is the task of physicians to warn parents that conflicts in the life of the child due to faulty environmental influences may lead to various disturbances of sleep.

So much for the disturbed sleep of children. I have endeavored to present the case along different lines from those of the usual text-books in which the symptoms of different types of sleep disturbance take up the bulk of the space and typology is practically ignored. But it is particularly the division into types that points the way to individual treatment which alone offers prospects of success.

I have dealt with disturbed sleep of children somewhat at length because these forms present purer, clearer, so to speak, less adulterated conditions than the more complicated and involved types in adults. Taken each in their original forms they teach us much that we are able to apply to the conditions applicable to adults. I am therefore in a position to be more brief in my observations on the subject of adult sleep disturbances and the necessary treatment. In the case of adults conditions are more diffi-

cult, for the reason that the stimuli of the environment are more complex.

Matters have progressed so far that we are confronted with exhaustion of the nervous system, commonly known as neurasthenia, the most prevalent symptom of which is insomnia. And then again many organs of the body are affected, and they too are partly responsible for the disturbance of sleep. The first step, therefore, is to examine, internally and neurologically, all the organs in order to determine all defects, if any. In adults it is especially heart disease which appears to play a special part in disturbed sleep. It appears to me that adults suffering from heart disease but otherwise not easily exhausted, such as many hypertensives, quickly fall asleep on retiring at night. The curve of sleep, however, at first rapidly ascending, soon ceases to rise and then rapidly declines. Restlessness sets in and the sufferer awakes in the early hours of the morning. The next phase is merely restless, superficial sleep, dozing, or perhaps no more sleep at all until morning. This condition of the hypersensitive patient, which is also often met with in patients suffering from heart trouble, is difficult to explain. Perhaps the reason is that the patient rapidly falls asleep owing to the exhaustion consequent upon the day's work and excitement. As soon as the wastage of the day has been made good, the myocardium, the cardiac muscle, is supplied with renewed strength; the result is more powerful action of the heart, and it is just this stimulated action of the heart that awakes the sleeper.

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from heart trouble is, as also pointed out by A. Friedemann, that certain soporifics, for instance those of the veronal group, interfere with diuresis and sometimes even diuretics are powerless to eliminate such interference. In every case it is necessary to regulate the heart action and to alleviate the state of unrest to which these sleepless heart patients are subject. And we must remember that in every adult suffering from disturbed sleep the diagnosis and treatment of the nervous conditions are paramount. There are certain features of importance in practice for every physician called upon treat a patient suffering from more or less acute insomnia which I shall now proceed to discuss.

Above all, it appears to me to be particularly important not to postpone all curative measures until late in the evening, but to begin earlier in the day. As far back as twenty years ago I issued a warning against applying hydrotherapeutic treatment—as recommended by other authorities on insomnia—late in the evening.¹⁵ In this hydrotherapeutic treatment it is surely always necessary to bear in mind the consequent re-congestion in the blood vessels, which may very possibly destroy the effect of the treatment if administered late in the evening. But even in the most simple procedures we must not bind ourselves hard and fast to any particular dogmatic thesis, but must bear in mind that in adults the psychological treatment of insomnia plays the most important rôle.

A soporific administered at the psychological moment is undoubtedly a valuable remedy which we cannot dispense with entirely. Nevertheless we must bear in mind that it is a sign of the times in which we live if the patient looks upon soporifics as a comfort which is to be taken for granted. And I must admit that many of us are much too prone to succumb to the autosuggestion of the patients who look upon soporifics as their only salvation and we meekly prescribe as much as they want. There is another point of psychological importance to be noted when prescribing soporifics when they are really necessary. The

best form in which to administer these remedies is in the form of powders or in tablet form, but *never* in liquid form, as drops. The excited patient may forget to count the number of drops prescribed; he simply pours into the glass the quantity he thinks will help him. I recently had a case of poisoning by an overdose of soporific mixture, due to carelessness of this kind.

What must be our method of procedure psychotherapeutically? Having determined the cause of the insomnia or disturbed sleep, the first step is to calm the patient; and we must make him understand that he must look upon his attacks of insomnia in a different light. Assure him that in all probability it is not really the disturbed night's rest that gives him that tired feeling the next morning, but that he is merely aggravated because he was forced to keep awake so long. And then advise him that he must not let the loss of a night's good rest upset him, that a somewhat restless night will not do him any real harm, etc., etc. There are many other psychological features to be put before the patient—features which, simple enough in themselves, somehow or other have never occurred to him. Many a time a patient can be helped by simple explanations along these lines.

Should this psycho-pedagogic method prove inadequate we must proceed to definite suggestive measures. My "Milieu Suggestive Method," already referred to, is, notwithstanding its simplicity also suitable for critical adults. You ask the patient to lie down, relax all his muscles and limbs. Tell him to close his eyes (without going to sleep), to breathe gently and regularly and silently to count the number of respirations. I then ask the patient to listen quietly, without replying to what I say. I transport him by suggestion to surroundings agreeable to him, for instance, the city dweller to the mountains for which he is longing. I say something of this sort: "Try and imagine that you have left town, you are far away in the mountains. You see in front of you the mountain peak, it isn't far, you're quite close to it! You're tired, but a kind of satis-

fied feeling is coming over you and you sit down on a bench and now you are gazing down into the valley, far below! The sun is so beautifully warm—delicious peace and quiet surround you. Deep down in the valley you see the houses, tiny little toys! There goes a train! Like a little snake twisting along the valley; in the distant background more hills, half hidden in a purple haze. Opposite you in the foothills there are cultivated fields, all different colors. You can faintly hear bells chiming in the distance; everything around you is peaceful as twilight on a summer's eve! Peace and quiet is everything. You too are going to be peaceful and quiet within, and then the question whether you at times sleep a little better or a little worse will be of no further importance to you. Gradually you will sleep soundly—and so on—.”

Of course, at every new “sitting” it is necessary to suggest to the patient a new picture which is agreeable to him—naturally in keeping with his educational standard—and it is in this constant change of suggestive picture that the physician is confronted with a certain amount of difficulty. As simple as this method appears to be you may rest assured that even the critical adult patient who at first is inclined to be skeptical about this suggestion therapy will after the first few attempts acknowledge the benefit received therefrom. Thus for example I remember a particularly severe case of insomnia; a critical man who a few years ago during a severe crisis collapsed owing to insomnia of the severest kind. He was utterly incapable of work of any kind but was completely cured by this method and this method alone, in a few weeks, notwithstanding the fact that at the commencement of the treatment he declared that he had no faith whatever in such methods. At any rate I can confidently recommend this “Milieu Suggestion Method,” correct administration of which of course requires a certain amount of experience, as a simple and yet effective method. As a consequence of the successful results achieved by this, I think I can dispense with hypnosis which is disliked and strongly objected to by many patients.

When faith in sleep, in the ability to sleep and consequently sleep itself, has been restored the physician's duty is not yet finished. We must endeavor to prevent a recurrence of the trouble. To this end we must, first of all, endeavor to assist the patient in regulating his daily life and habits. For in the hurry and irregularity of present day existence lies the difficulty; that is the chief exogenous factor in which the nervous disorders originate.

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OUTLINE OF PREVENTIVE MEDICINE

The book on Preventive Medicine, issued under the auspices of the Committee on Public Health Relations of The New York Academy of Medicine, was published by Paul B. Hoeber, Inc., in September, 1929, and has already had two printings. The Committee is much gratified with the reception the book has received, and with the concrete evidence of the need of a treatise of this kind. The following excerpts from a number of reviews throw an interesting light on the attitude of the professional press toward the practice of preventive medicine:

CLINICAL MEDICINE & SURGERY, October, 1929.

"The trend of public opinion and, to a large extent, of professional medical opinion, within recent years, verges to the view that an increasing part in the future of medicine will be of a prophylactic nature looking to prevention of disease rather than to its cure.

"To ignore the trends of public opinion is foolish, especially when they are rational. Physicians must be in the van of all betterment movements and be prepared to lead, not follow them. A book of this type, a textbook of one of the newer practices of medicine, or at least of one of the main paths in such practice, will be of great assistance to the profession, not alone as a guide in making periodic examinations, but also as a manual of general prophylaxis and personal hygiene."

MILITARY SURGEON, December, 1929.

. . . "The purpose of the work is to supply the need of the general practitioner and student of medicine for a production containing the salient points of preventive medicine without the didactic completeness of a textbook. . . . Many of the subjects dealt with in the various chapters are not ordinarily considered in books on preventive medicine. The suggestions made by the writers are gained from experience in their specialties and are presented in a manner that can be clearly understood, as technical terms are avoided. The information furnished will enable the general practitioner to render valuable assistance and advice to many of the patients formerly directed by him to specialists and will enable him to afford better service to those who are referred to him by school physicians or health authorities. *The tendency of many physicians in general practice is to regard preventive medicine as a specialty engaged in by health authorities, school physicians, and others who are trained in schools of public health. This book presents the subject to him in a new way and should convince him that this is his field.* Working with this viewpoint, he will not only be able to render better service to those who consult him, but will be meeting a demand which the public has been educated to make."

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
November 16, 1929.

"This book is designed to aid the general practitioner in the important task of preserving the health of the people not only by preventing disease but also by preventing serious turns and complications in diseases that have been contracted."

CANADIAN MEDICAL ASSOCIATION JOURNAL, December, 1929.

. . . "The book has much merit and could be profitably read by medical practitioners and students. It is particularly gratifying to see this evidence of interest in preventive medicine on the part of the New York Academy of Medicine, for which they deserve hearty commendation."

WEEKLY BULLETIN OF THE CITY OF NEW YORK DEPARTMENT OF HEALTH, October 12, 1929.

"The New York Academy of Medicine's Committee on Public Health Relations has just published an outline of preventive medicine which in its brief compass of less than 400 pages contains a wealth of stimulating facts indispensable for physicians, health administrators and public health workers. . . . It is unavoidable that in a work of this kind the style and character of the contributions should vary. All of the articles, however, contain valuable information and most of them are remarkably excellent and helpful. The convenient size of the book, its excellent typography, the absence of unimportant details and the authoritative character of the contributions make the work extremely useful to those seeking to orient themselves concerning present-day teachings in preventive medicine."

JOURNAL OF MEDICINE, November, 1929.

"The subject of preventive medicine as is stated in the Foreword, is most fundamental in importance to the medical profession.

"The book is really a manual of preventive medicine and as such is entirely new in this field, containing information equally valuable to the specialist and general practitioner."

UNITED STATES NAVAL MEDICAL BULLETIN, January, 1930.

"Into this comparatively small book has been compressed more information useful to the practitioner and medical student concerning preventive medicine than can be found in many of the larger textbooks on the subject. . . .

"As a book which stimulates interest in public-health work and points the way to more extensive study of this most important subject it may be highly commended."

JOURNAL OF THE KANSAS MEDICAL SOCIETY, October, 1929.

. . . "The publishers and the authors should be commended for the production of this book."

WEST VIRGINIA MEDICAL JOURNAL, January, 1930.

. . . "The volume is purely a quick reference book.
It would make a handy addition to any library."

SOUTHERN MEDICINE & SURGERY, September, 1929.

. . . "The book contains much of value to the practitioner who is trying to do his duty by his patients without enlisting for life to work without remuneration under salaried officials, or under more or less balmy and more or less rich meddlers into matters which are beyond them."

INDIANAPOLIS MEDICAL JOURNAL, October, 1929.

. . . "The material in this book presents much food for thought, and makes one wonder if he is doing all he can and should towards prevention of disease."

HAHNEMANNIAN MONTHLY, November, 1929.

"A small and practical book on a novel plan, written for the medical practitioner and student, the information it imparts is fundamental. Moreover it is so clearly written, the facts so well formulated, that we feel it to be a most excellent and safe volume to put into the hands of the layman who wishes to know something real or reliable about preventive medicine. Indeed, we feel that it is a book to be utilized for the education of humanity in general.

"The novelty of the work rests in its sponsors, viz:—the Public Health Relations Committee of the New York Academy of Medicine, which has delegated the work to the Editorial Committee, as stated on the title page."

MEDICAL TIMES, October, 1929.

"This is a much needed presentation of the subject of preventive medicine, which is rapidly and properly becoming the keynote of modern practice. . . . We think it is the duty of *every progressive practitioner to assimilate thoroughly the entire contents of this work, and to apply them wherever possible.*"

LONG ISLAND MEDICAL JOURNAL, January, 1930.

. . . "The modern practitioner of medicine who is expected to practice preventive medicine either as a specialist or a generalist will, upon reading this book, find welling up in his memory much that he knows but has overlooked.

"He should read it."

MEDICAL WORLD, November, 1929.

. . . "It is a very reliable and useful book."

JOURNAL OF ARKANSAS MEDICAL SOCIETY, October, 1929.

. . . "We believe this book represents the minimum knowledge of the subject which physicians should be expected to possess."

CANADIAN JOURNAL OF MEDICINE & SURGERY, Feb., 1930.

"A strikingly interesting, instructive and unique handbook is here offered the practitioner and student of medicine. Among the numerous contributors are found successful busy practising physicians.

"This newer order of things is not being thoughtlessly precipitated.

It is a development of our progressive age. The physician must face the change, not reluctantly, nor by frank opposition, but rather by energetic participation. He must remain in command. To this purpose this book will commend itself to every progressive medical practitioner, be he the most unpretentious and humble, or the most learned and exalted."

JOURNAL OF LABORATORY & CLINICAL MEDICINE, Dec., 1929.

... "This book, it seems, to the reviewer, fills a needed want. Simply written, yet authoritative, its perusal should arouse thought and give impetus to the necessary study required to practice preventive medicine in the fullest sense. It may be read with profit by physician and layman alike."

MEDICAL MENTOR, January, 1930.

"This is a most timely publication, its appearance having anticipated by a short interval the month of November which had been designated by general consent the month of preventive medicine. The work was undertaken by the Committee of Public Health Relations of the New York Academy of Medicine, which was one of the early advocates of periodic health examinations, even at a time when the movement was regarded with a calm step-motherly interest by the bulk of the medical profession, and sometimes dubbed the "Chinese method," in reference to the legend that the Chinese paid their doctors only when well, the client when ill being entitled to gratuitous treatment. However, the movement has grown, and the prevention of disease is now recognized as a duty of the physician fully equal to that of the care of the sick." ...

NEW ENGLAND JOURNAL OF MEDICINE, January 9, 1930.

"This little book, with a section devoted to each of the particular specialties and evidently written by a man familiar with the specialties, seems to us to be of considerable value. It does not purport to be a textbook of physical diagnosis, but it does bring together some of the data that have been made available by various health studies."

NEW ORLEANS MEDICAL & SURGICAL JOURNAL, Feb., 1930.

... "The Foreword by Dr. Charles L. Dana and the Introduction by the Editorial Committee, Drs. Frederic E. Sondern, Chas. Gordon Heyd and E. H. L. Corwin, are gems and should be carefully read and studied by every practicing physician. . . . A perusal of this splendid little book arouses admiration for the marvelous capacity of the authors to compose so much knowledge in so small a space. Every page is interesting and no library is complete without it—especially the busy practitioner of general medicine—the family doctor. The book reflects great credit on the New York Academy of Medicine, the Committee and the publishers."

THIRD GRADUATE FORTNIGHT

October 20 to 31, 1930

"MEDICAL AND SURGICAL ASPECTS OF ACUTE BACTERIAL INFECTIONS"

The third annual Graduate Fortnight of The New York Academy of Medicine will be held from October 20 to 31, 1930. The general subject which has been chosen for this year is "Medical and Surgical Aspects of Acute Bacterial Infections."

The program as arranged is in two parts,—coordinated afternoon clinics to be held in ten important hospitals of the city, and evening meetings to be held at the Academy. An added feature of this year's Fortnight will be an exhibit of anatomical, bacteriological and pathological specimens and research material bearing upon the various aspects of the subject.

Each of the hospitals cooperating in the Fortnight will present two afternoon clinical programs dealing with different phases of the general subject.

The program for the evening meetings to be held at the Academy includes discussions of:

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| Focal infections as a cause of disease. | Acute infections of the upper respiratory tract including influenza. |
| Osteomyelitis and acute joint infections. | The pneumonias and other pneumococcus infections. |
| Acute infections of the genito-urinary tract. | Bacteriophage as a treatment in medical and surgical acute bacterial infections. |
| Infections arising from tonsils and sinuses. | Puerperal sepsis. |
| Infections of the middle ear. | Immunity—general and local. |
| Acute infections of the face and oral cavity. | Serum therapy. |
| Operative risks from infection. | Vaccine and non-specific protein therapy. |
| Appendicitis. | Rheumatic fever. |
| Bacteriemia. | Acute and sub-acute bacterial endocarditis. |
| Suppuration of lung and pleura. | Meningococcus infections including meningitis. |
| Acute infections of the gall-bladder and biliary tract. | |
| Infections of the skin and subcutaneous tissue. | |

The list of speakers who have been invited to take part in the Fortnight includes prominent clinicians from many parts of the country who are recognized authorities in their special lines of work.

The profession generally is invited to attend.

No fees will be charged for attendance at any of the clinics or meetings on the program.

A complete program and registration blank for special clinics and demonstrations will be mailed on request.

RECENT PUBLICATIONS OF THE COMMITTEE ON MEDICAL EDUCATION

The Committee on Medical Education has just published a revision of the "Synopsis of Approved Opportunities Offered in Greater New York For Graduate Study in The Clinical Specialties." The Synopsis covers the subjects of Dermatology and Syphilology, Internal Medicine, Neurology and Psychiatry, Obstetrics and Gynecology, Ophthalmology, Oto-Laryngology, Pediatrics, Roentgenology, Surgery, Orthopedic, Traumatic and Rehabilitation Surgery, Physical Therapy, and Urology.

The Committee has also published a revision of the "Bulletin of Non-Operative Clinics and Conferences" which announces a total of 176 clinics held in 61 approved hospitals of the city.

Copies of the Synopsis and of the Bulletin may be obtained upon request to the Bureau of Clinical Information.

RECENT ACCESSIONS TO THE LIBRARY

- American antiquarian society. Bibliography of American cookery books.
Worcester, 1929, 145 p.
- American dental assoc. Comm. on nomenclature. Dental terminology
adapted from the B. N. A.
[Chic.], 1930, 51 p.

- Atkins, A. J. The triune principle of life and philosophy of the soul.
[San Francisco, 1929], 70 p.
- Berg, H. H. Röntgenuntersuchungen am Innenrelief des Verdauungskanal.
Leipzig, Thieme, 1930, 198 p.
- Bianchi, L. Foundations of mental health.
N. Y., Appleton, 1930, 276 p.
- Broesike, G. Repetitorium anatomicum.
Leipzig, Kornfeld, 1930, 305 p.
- Cameron, A. T. and White, F. D. A course in practical biochemistry.
London, Churchill, 1930, 222 p.
- Chaloner, L. Modern babies and nurseries.
London, Milford, 1929, 122 p.
- Drouin, H. La vie de Louis Pasteur. 14. ed.
Paris, Gallimard, 1929, 244 p.
- Emerson, W. R. P. The diagnosis of health.
N. Y., Appleton, 1930, 272 p.
- Feldman, M. H. A manual of exodontia. 2. ed.
Phil., Lea, 1930, 220 p.
- Fishberg, A. M. Hypertension and nephritis.
Phil., Lea, 1930, 566 p.
- Frieboes, W. Lehrbuch der Haut-und Geschlechtskrankheiten.
Leipzig, Vogel, 1930, 677 p.
- Gruner, O. C. A treatise on the Canon of medicine of Avicenna.
London, Luzac, 1930, 612 p.
- Handbuch der Kindertuberkulose.
Leipzig, Thieme, 1930, v. 1.
- Hauffe, G. Herz, Pulsation und Blutbewegung.
München, Lehmann, 1930, 246 p.
- Henderson, D. K., and Gillespie, R. D. A text-book of psychiatry. 2. ed.
London, Milford, 1930, 526 p.
- Herrick, C. J. The thinking machine.
Chic., Univ. of Chic. Pr., [1929], 374 p.
- Hessey, J. D. Colour in the treatment of disease.
London, Rider, [1929], 79 p.
- Hogarth, A. M. The rat: a world menace.
London, Bale, 1929, 112 p.
- Hollingworth, H. L. Vocational psychology and character analysis.
[new ed.].
N. Y., Appleton, 1929, 409 p.
- Human biology and racial welfare . . . ed. by E. V. Cowdry.
N. Y., Hoeber, 1930, 612 p.
- Humphris, F. H. Artificial sunlight and its therapeutic uses. 5. ed.
London, Milford, [1929], 340 p.
- Hutchison, R. and Hunter, D. Clinical methods. 9. ed.
N. Y., Hoeber, [1929], 864 p.
- Hyatt, T. P. Hygiene of the mouth and teeth.
Bklyn, Bklyn Dental Publ. co., [1929], 64 p.

- Kittel, P. B. Haemodynamics.
London, Lewis, 1929, 195 p.
- Kleeberg, J. and Behrendt, H. Die Nährpräparate.
Stuttgart, Enke, 1930, 346 p.
- Kraetzer, A. F. Procedure in examination of the lungs.
N. Y., Oxford Univ. Pr., [1930]. 125 p.
- New York (city). Department of hospitals. The Bellevue hospital nomenclature of diseases.
N. Y., Hoeber, [1930], 232 p.
- Norris, G. W. and Landis, H. R. M. Diseases of the chest, and the principles of physical diagnosis. 4. ed.
Phil., Saunders, 1929, 954 p.
- Ortmann, O. The physiological mechanics of piano technique.
London, Paul, 1929, 395 p.
- Pfeifer, R. A. Grundlegende Untersuchungen für die Angioarchitektonik. des menschlichen Gehirns.
Berlin, Springer, 1930, 220 p.
- Reijnders, A. F. M. Die Psychologie der Biologen.
Haag, Nijhoff, 1929, 207 p.
- Roca Puig, P. A la futura madre.
Barcelona, Ediciones "Pro-Raza." 1930, 243 p.
- Rogers, C. H. A text-book of inorganic pharmaceutical chemistry.
Phil., Lea, 1930, 676 p.
- Ruete, A. Differentialdiagnostischer Führer durch die Dermatologie.
Leipzig, Vogel, 1930, 173 p.
- Smith, G. E. Human history.
London, Cape, [1930], 509 p.
- Stephenson, T. Incompatibility in prescriptions and how to avoid it.
N. Y., Hoeber, 1929, 61 p.
- Stokes, J. H. Dermatology and syphilology for nurses.
Phil., Saunders, 1930, 311 p.
- Stratton, G. M. Social psychology of international conduct.
N. Y., Appleton, 1929, 387 p.
- Technik im Krankenhaus; bearb. von. J. Diehl, F. Eckhardt,
J. Fichtl. [et al].
Berlin, Springer, 1930, 310 p.
- Tilney, F. The master of destiny.
Garden City, Doubleday, 1930, 343 p.
- Warthin, A. S. The creed of a biologist.
N. Y., Hoeber, 1929, 60 p.
- Zander, P. Das Für und Wider der chirurgischen Behandlung des Gallenleidens.
Leipzig, Thieme, 1930, 89 p.

PROCEEDINGS OF ACADEMY MEETINGS

APRIL

STATED MEETINGS

Thursday Evening, April 3, at 8:30 o'clock

Program presented in cooperation with

THE NEW YORK ACADEMY OF DENTISTRY
AND THE SECTION OF OPHTHALMOLOGY

ORDER

I. PAPERS OF THE EVENING

Oral infections and their relation to diseases of the eye

- a. The viewpoint of the ophthalmologist, W. F. C. Steinbugler
- b. The viewpoint of the general practitioner of dentistry, Henry W. Gillett, Prof. of Dentistry, Columbia University (by invitation)
- c. The viewpoint of the oral surgeon, Henry S. Dunning, Prof. of Oral Surgery, Columbia University

Discussion, Conrad Berens, James G. Dwyer, Arthur H. Merritt (by invitation), John Oppie McCall (by invitation)

II. GENERAL DISCUSSION

III. EXECUTIVE SESSION—Section of Ophthalmology

Nomination of officers and one member of advisory committee

Thursday Evening, April 17, at 8:30 o'clock

THE SEVENTH HARVEY LECTURE

"Electrical Phenomena in the Living Cell"

WINTHROP J. V. OSTERHOOT

Member of the Rockefeller Institute for Medical Research
New York City

G. Canby Robinson, President, Harvey Society

Dayton J. Edwards, Secretary, Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for April.

SECTION MEETINGS

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, April 1, at 7:45 o'clock

(Please Note Change of Hour)

ORDER

I. PRESENTATION OF PATIENTS

Cases from the City Hospital

II. MISCELLANEOUS CASES

III. DISCUSSION OF CASES

IV. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee

NOTE: Examination of cases is limited to members and their invited guests.

SECTION OF SURGERY

Friday Evening, April 4, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Traumatic inguinal hernia, Edward V. Deneen (by invitation)
- b. 1. Splenectomy for thrombocytopoenic purpura
2. Carcinoma of hepatic flexure of colon. Mickulitz operation.
Cholecystectomy two months later for acute cholecystitis,
Edward J. Donovan
- c. Carcinoma of ovary, John J. Westermann, Leila C. Knox

III. PAPERS OF THE EVENING

- a. A clinical and microscopic study based on 250 cases of melanoma.
A comparison of therapeutic procedures and their end-results,
Frank E. Adair, George T. Pack (by invitation)
- b. Diverticula of the appendix, Paul K. Sauer (by invitation)

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, April 8, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICO-PATHOLOGICAL PRESENTATION

Ependymoma of the spinal cord, Lewis Stevenson, Byron Stookey,
Percival Bailey

III. CLINICAL PRESENTATION

- a. Hemorrhage into syringal cavity
- b. Syringomyelic joint degeneration, Foster Kennedy, E. D. Friedman, Marcus Neustaedter, Isador Abrahamson, Ira Cohen, Moses Keschner

IV. PAPERS OF THE EVENING

- a. Epilepsy with co-incident vagotonic symptoms, E. D. Friedman
Discussion, Michael Osñato, Samuel Brock, I. H. Pardee, Foster Kennedy
- b. Astroblastomas of the brain, Percival Bailey (by invitation)
Discussion, Wilder G. Penfield, Joseph H. Globus

V. EXECUTIVE SESSION

Nomination of officers and two members of advisory committee

SECTION OF PEDIATRICS

Thursday Evening, April 10, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. The dosage of ultraviolet in tetany in infants, Harry Bakwin, Ruth Morris Bakwin (by invitation)
General Discussion
- b. Cerebral dominance as a factor in the acquisition of spoken and written language, Samuel T. Orton (by invitation)
Discussion, Frederick Tilney, Howard W. Potter (by invitation)
- c. Conservation of the school child's health, William Rosenson
General Discussion

II. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee.

SECTION OF OTOTOLOGY

Friday Evening, April 11, at 8.30 o'clock

ORDER

I. READING OF MINUTES

II. PRESENTATION OF CASES

- a. Arterio-venous aneurysm of auricle
Resection of external carotid
F. W. Graef (by invitation)
- b. Radical mastoidectomy performed by nature
- c. Simple mastoidectomy performed by nature
- d. Auditory nerve deafness following mumps
A. Nigro (by invitation)

III. REPORT OF CASES

- a. Mastoiditis-sinus thrombosis and pyaemia
C. M. Griffith (by invitation)
- b. Otitic meningitis, due to pneumococcus
A. M. Street (by invitation)

IV. PAPER OF THE EVENING

Auditory nerve deafness

A. Schattner (by invitation)

V. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee.

SECTION OF MEDICINE

Tuesday Evening, April 15, at 8:30 o'clock

SYMPOSIUM ON THERAPEUTIC SERA

ORDER

I. PAPERS OF THE EVENING

- a. Poliomyelitis, William H. Park
- b. Scarlet fever, Alphonse R. Dochez

- c. Meningitis, Henry W. Jackson (by invitation)
- d. Erysipelas, Harold L. Amoss, The Johns Hopkins Hospital (by invitation)

II. DISCUSSION, Russell L. Cecil

III. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, April 16, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPERS OF THE EVENING
 - Medical aspects of the treatment of benign prostatic hypertrophy, E. Cowles Andrus, The John Hopkins Hospital (by invitation)
 - Discussion, Nellis B. Foster, Milton J. Raisbeck, J. Sturdivant Read, Oswald S. Lowsley, Benjamin S. Barringer, E. Cowles Andrus

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Nomination of officers and one member of the advisory committee

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, April 18, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
 - Physiology and chemistry of calcification, John P. Peters, Professor of Medicine, Yale University (by invitation)
 - Discussion opened by Frederic W. Bancroft, Robert F. Loeb
- III. EXECUTIVE SESSION
 - Nomination of officers and one member of advisory committee.

SECTION OF OPHTHALMOLOGY

The regular meeting was not held on April 21 for the reason that the Section combined with The New York Academy of Dentistry in presenting the Stated Meeting of the Academy on April 3.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, April 22, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. CASE REPORTS
 - a. Chronic menorrhagia cured by galvanic dilatation and zinc chloride ionization
 - b. Post-operative chronic menorrhagia cured by x-ray, Victor C. Pedersen
 - Discussion, Henry Roth

III. PAPERS OF THE EVENING

- a. Treatment of cervicitis by copper ionization, David W. Tovey
- b. Gynopathic backache; its nature and the mechanism of its production, Arnold Sturmdorf

Discussion, Edward A. Bullard, Irving Smiley

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, April 23, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF INSTRUMENTS

Improved armamentarium for tonsillectomy, Harry Neivert (by invitation)

III. REPORT OF CASES

Radium seed in ethmoid region, Rudolph Kramer

IV. PAPERS OF THE EVENING

Subject: THE ETHMOIDS

a. Anatomical features, J. Parsons Schaeffer, Philadelphia (by invitation)

b. Non-surgical treatment, J. Irvine Dowling, Albany, N. Y.

c. Zinc ionization treatment, John McCoy

d. Intra-nasal surgery (demonstration on wet specimen), Sidney Yankauer

e. External operation, E. Ross Faulkner

Discussion opened by Francis W. White

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

Nomination of officers and one member of advisory committee

SECTION ON HISTORICAL AND CULTURAL MEDICINE

As the Section meets only in November, January, March and May, the Nominating Committee met at the Academy on April 1, 1930, and nominated candidates for Chairman, Secretary, and one member of the Advisory Committee for the ensuing year, in accordance with the Constitution and By-Laws which require such nomination in April. The nominees are announced on the program for the May meeting of the Section.

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, April 24, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. A case of so-called acute isolated myocarditis, Clarence de La Chapelle, Irving Graef (by invitation)

- b. A case of multiple arterial thromboses, Milton Halpern (by invitation)
- c. Acute ulcerations in the stomach in children, Benjamin Rice Shore (by invitation)
- d. Anomalous origin of the right subclavian artery, Vera B. Dolgopol

II. EXECUTIVE SESSION

Leila Charlton Knox, President, St. Luke's Hospital
 Beryl H. Paige, Secretary, The Presbyterian Hospital

NEW YORK MEETING

of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday, April 16, at 5:00 o'clock

(Please note change of hour)

Annual Scientific and Business Meeting

- I. An accurate and practical method for blood platelet counting, A. E. Casey, O. M. Helmer
 Introduced by L. Pearce
- II. The fate of foreign sugars in the blood stream, E. H. Fishberg, B. T. Dolin
- III. The sedimentation rate of the erythrocytes in chronic arthritis, M. H. Dawson, R. H. P. Sia, R. H. Boots
- IV. Effect of feeding specific polysaccharide on resistance to pneumococcus, Victor Ross
- V. Biochemical studies of bacterial derivatives. The preparation of human tubercle bacillus protein MA-100, P. Masucci, K. L. McAlpine
 Introduced by F. M. Huntoon
- VI. The relation of vitamin D to deposition of calcium in bone, H. C. Sherman, H. K. Stiebeling
- VII. Some differences in action between irradiated ergosterol and cod liver oil, A. F. Hess, H. Rivkin, M. Weinstock
- VIII. Electrolyte content of blood and urine in dogs with pancreatic fistulae, T. F. Zucker, M. Gutman-Newburger, B. N. Berg

Annual Dinner to Follow Meeting

Annual business meeting at 8:00 P.M., included reports of elections of Secretary, of Treasurer, of President, and discussion

Peyton Rous, President, A. J. Goldforb, Secretary.

FELLOWS ELECTED MAY 8, 1930

William James Barnes.....	155 Engle Street, Englewood, N. J.
George Renfrew Brighton.....	20 East 53rd Street
Samuel C. Burchell.....	123 East 53rd Street
Oswald Robert Jones.....	133 East 64th Street
Robert K. Lambert.....	7 East 85th Street
Robert K. Lippmann.....	910 Park Avenue
Thomas T. Mackie.....	103 East 78th Street
William McLean.....	375 West End Avenue
Carl Reich.....	245 West 24th Street
Nelson B. Sackett.....	120 East 75th Street
Arthur Woodward Booth.....	222 West Church Street, Elmira, N. Y.

ASSOCIATE FELLOWS

Kenneth Clark Blanchard, Ph.D.....	New York University
Hans T. Clarke, D.Sc.....	630 West 168th Street

CORRECTION

In the list of the Fellows elected April 3, as printed on page 286, line 5, of the April number of *The Bulletin* (Vol. VI, No. 4), the name of Louis T. Wright appears in error.

DEATHS OF FELLOWS OF THE ACADEMY

BONNETTE WIGHT HOAGLAND, M.D., Woodbridge, New Jersey; graduated in medicine from the University of Pennsylvania, in 1886; elected a Fellow of the Academy January 4, 1912; died, April 8, 1930. Dr. Hoagland was a member of the Board of Governors of the Rahway Memorial Hospital, Rahway, N. J.

HARRY H. SEABROOK, M.D., 71 Fulton Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1881; elected a Fellow of the Academy March 5, 1891; died, April 9, 1930. Dr. Seabrook was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Society of Alumni of Bellevue Hospital and on the staffs of Presbyterian and St. Luke's Hospitals and the New York Eye and Ear Infirmary.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VI

JUNE, 1930

No. 6

EDITORIAL

PROGRESS IN THE CATALOGUING OF MEDICAL INCUNABULA

WITH A REVISED CHECK-LIST OF THE INCUNABULA IN THE
ARMY MEDICAL LIBRARY, WASHINGTON, D. C.

Before long, we shall have a definitive catalogue of the medical incunabula by a medical scholar who has devoted a good part of his life to the subject. Incunabula are books, pamphlets or broadsides printed in the 15th century (before 1501), the first to be set in moveable type. The term "incunabula" (a Latin neuter-plural) implies "cradles" or "swaddling clothes" of typography and was first employed by Cornelius van Beughem in his *Incunabula typographia* (Amsterdam, 1688), the earliest printed catalogue of 15th century publications. At this time, two hundred years after the death of Gutenberg (*circa* 1400-1468), it is said that Caxtons could be purchased in English book-stalls for a few shillings. We first hear of Gutenberg's activities in the "Black Art" in a trial of 1439, in which Hans Dünne, a goldsmith stated that, as early as 1436, Gutenberg had paid him 100 gulden for "services concerned with printing" (*das zu dem trucken gehöret*). The data of Gutenberg's life are obscure. What is known is largely a record of struggles with financial difficulties, borrowing money, and imprisonment for debt. To him are ascribed an astronomical calendar for the year 1448, discovered in the binding of a MS. in the monastery of Schönau (near Mainz) and presumably printed in 1447, the 36-line Bible (undated but not

parchment (*pergamentarii*).¹ Toward the end of the 12th century, the universities of Paris and Bologna plied, as Ballard says, "an organized book-business" which, by the beginning of the 15th century, had expanded to a flourishing extra-mural trade in MSS. at Venice, Florence and Paris. The printed block-books or xylographs of medical interest were the *Speculum humane salvationis*, the *Ars moriendi*, the *Dance of Death*, often illustrated with skin-and-bone (*Hautskelett*) figures, and the palmistry (*Die Kunst Chiromantia*) of the physician Johan Hartlieb.

Whatever the claims of Coster, there are no Dutch incunabula of authenticated or printed dates prior to the *Scolastica historia* of Petrus Comestor, printed by Nicolaus Ketalaer and Gherard van Leempt at Utrecht in 1473; while nearly every year of the latter half of the 15th century witnessed the initial output of some new German press, either in Germanic cities or in cities of the outland. The credit of the invention and establishment of the art of printing as a going concern in the advancement of civilization, therefore, belongs overwhelmingly to Germany, as will be apparent from the following chronology:

- 1450-61—Mainz: by Printers of the 31-line Indulgence and the 36-line Bible:
 Nicolaus V: Indulgence (4 issues, No. 1 by Gutenberg), 1450-55.
 Donatus (Aelius): *De octo partibus orationis* (circa 1455).
 Biblia Latina (not later than 1461).
 By printers of the 42-line Bible and the 30-line Indulgence:
 Nicolaus V: Indulgence (April 29, 1455).
 Biblia Latina (Mazarine Bible) (1453-56).
 Donatus (Aelius): *De octo partibus orationis* (circa 1455).
 1457-65, Mainz: by Johann Fust and Peter Schoeffer:
 Psalterium cum canticis, Mainz, August 14, 1457.
 Psalterium ad honorem Sancti Jacobi, Mainz, August 29, 1457.
 Duranti (Gulielmus). *Rationale divinorum officiorum*. Mainz, October 6, 1459.
 Clement V. *Constitutiones*, June 25, 1460.
 Biblia Latina, August 14, 1462.
 Boniface VIII. *Liber sextus decretalium*. December 17, 1465.
 Cicero: *De officiis*, 1465.
 I—I The same, February 4, 1466, [etc.]
 1461-78, Strassburg: by Johann Mentelin:
 Biblia Latina, August 14, 1462.
 1464-78, Strassburg: by Adolf Rusch (the R printer)
 Duranti (Gulielmus). *Rationale divinorum officiorum* (not after 1464) [etc.]

The sack of Mainz, by Adolf II of Nassau (1462), not only interrupted the activities of Fust and Schoeffer for three years running, but scattered German printers all

¹ By copying of available MSS., the scriptorium established by Trithemius in the monastery of Spanheim increased its library from 14 to 2000 MSS. items in a few years (Usler).

over Europe. Before September 30, 1465, Conrad Sweynheym and Adolf Pannartz, who had migrated into Italy to establish a press, published Cicero *De oratore* at Subiaco, and about the same time, Fust and Schoeffer began to print again in Mainz. The only other issues of the Subiaco press were the *Opera* of Lactantius (October 29, 1465) and the *De civitate Dei* of St. Augustine (June 12, 1467). Sweynheym and Pannartz then moved to Rome and from their second press came in 1467 reprints of the Lactantius and St. Augustine, the *Speculum* of Rodericus Zamorensis and the Epistles of St. Jerome. Between 1469 and 1473 they published Apuleius, Aristotle (Nicomachean Ethics), Aulus Gellius, Caesar's Commentaries, Livy, Lucan's *Pharsalia*, Ovid (*Opera*), Pliny the Younger (Natural History), Polybius, Quintilian, Strabo, Suetonius and seven works of Cicero. The Revival of Learning thus began under the most favorable auspices. The beginnings of printing in the different European countries may be indicated in the following chronological arrangement, adapted from Hawkins and Pollard:

- 1450-55. Germany: Calendar of 1448.
31-line Indulgence and 36-line Bible. Mainz, Johan Gutenberg, 1455.
1465. Italy: Cicero: *De oratore*. 4°. Rome. Conrad Sweynheym and Arnold Pannartz, 1465.
- 1465-74. Poland: Johannes de Turrecremata: [Torquemada], *Explanatio in psalterium*. 149 l. fol. Cracow, [1465].
Calendar (1474). Cracow, [Caspar Hochfeder (?)], 1475.
1468. Switzerland: Gregory I. *Moralia in Job*. 421 l. 4°. Basel, Berthold Ruppel, [not after 1468].
1468. Bohemia: Kronika Trojanská. 196 l. 4°. Pilsen, W. Pizni, 1468.
1470. France: Casparinus Barzizius. *Epistolae*. 118 l. fol. Paris, Ulrich Gering, Martin Crantz and Michael Friburger, 1470.
1473. Holland: Petrus Comestor: *Scholastica historia*. 144 l. fol. Utrecht, Nicolaus Ketelaer and Gherard de Leempt, 1473.
1473. Belgium: Dionysius de Leuwis alias Rickel. *Speculum conversionis peccatorum*. 28 l. 4°. Alost, 1473 (Hain 6248).
Æneas Sylvius (Pius II): *De duobus amantibus*. 4°. Alost 1473.
1473. Hungary: Chronica Hungarorum. 67 l. fol. Buda Pest, Andreas Hess, 1473.
1474. Spain: Bernardo Fenollar: *Les obres e trobes*. 4°. Valencia, Lambert Palmart, 1474 (Hain 6966). Reprinted 1895.
1475. Austria. *Geschichte des zu Trient emordeten Christenkindes*. 14 l. fol. Trent, Albrecht Kunne, 1475.
- 1475-77. England: Raoul Le Ferre: *The Recuyell of the Histories of Troy*. 352 l. fol [Bruges, William Caxton and Collard Mansion 1475.]
Diets (The) or Sayings of Philosophers. 78 l. fol. Westminster, William Caxton, November 18, 1477.
Caxton (William): *Advertisement*. 1 l. Broadside, Westminster, William Caxton, 1477.
1481. Savoy: Johannes de Turrecremata: *Contemplationes*. 30 l. 4°. Albi, November 12, 1481.

2 In 1926 Haebler discovered a History of Christ's Passion with woodcuts, printed perhaps in Italy by a strolling German in 1462.

1482. Denmark: *Breviarium Ottoniense*. Odense, Johann Snell, 1482 (Defective.)
Guillelmus Caorsinus: *De obsidione et bello Rhodiano*. 4°. Odense, Johann Snell, 1482.
1483. Sweden: *Dialogus creaturarum moralizatus*. 156 l. 4°. Stockholm, Johann Snell, December 26, 1483.
1487. Portugal: *Pentateuch*. fol. Faro, Samuel Giacon, June 30, 1487.
- [1488. Turkey: *Lexicon Hebraicum*. fol. Constantinople, Rabbi Gerson 1483.]
- ?1494. Montenegro: *Okolih ilih osmoglasnik*. 270 pp. fol. Cetinje, Macario, 1494.]³

The introduction of printing in the different German cities and the outstanding printers in these cities with their periods of activity may be tabulated chronologically as follows:

- 1450-1500. Mainz: Johan Gutenberg (1450-55); Johann Fust and Peter Schoeffer (1457-65); Peter Schoeffer (1467-1500); Jacob Meydenbach (1491-95); Peter von Friedberg (1493-1500).
- 1460-1500. Strassburg: Johann Mentelin (1460-78); Adolf Rusch, the R-printer (1464-80); Heinrich Eggestein (1466-74); Heinrich Knobloch (1476-84); Martin Schott (1481-99); Printer of *Legenda Aurea* (1481-2); Johann Reinhard alias Grüniger (1483-1500); Johann Prüss (1483-91); Printer of *Quedlinburg* (Sermones) (1483-99); Martin Flach, of Kittolsheim (1487-1500).
- 1466-1500. Cologne: Ulrich Zell (1466-1507); Arnold ther Hoernen (1470-83); Johann Koelhof, sr. (1472-93); Conrad Winters de Homborch (1475-79); Johann Guldenschlaß (1477-94); Heinrich Quentell (1479-1501); Cornelis de Zierikzee (1499-1517); Johann Landen (1496-1521).
- 1467-77. Eltvil (Prussia): Nicolaus Bechermünze (1467-77).
- 1468-1500. Augsburg: Günther Zainer (1468-78); Johann Schilssler (1470-73); Johann Bäumler (1472-95); Anton Sorg (1475-93); Johann Wiener (1475-79); Johann Froschauer (1481-1500); Johann Schönsperger (1486-1500); Johann Schobsser (1485-1500); Erhardt Ratdolt (1486-1528).
- 1470-1500. Nuremberg: Johann Sensenschmidt (1470-78); Anton Koberger (1471-1504); Friedrich Creussner (1472-99); Johann Müller [Regiomontanus] (1474-75); Peter Wagner (1483-1500); George Stuchs (1484-99); Caspar Hochfelder (1491-98); Postilla scholastica (1471).
- 1471-1500. Speier: Georg Peyser [Georgius de Spira] (1478-80); Peter Drach, sr. (1476-98); Johann and Conrad Hist (1483-88); Conrad Hist (1492-99).
- 1472-73. Laningen: St. Augustine: *De consensu evangelistarum*, April 12, 1473.
- 1472-77. Esslingen: Conrad Fyner (1472-77).
1473. Merseburg: Lucas Brandis (Aristotle: *Lapidarius*, October 20, 1473).
- 1473-99. Uim: Johann Zainer (1493-99); Conrad Dinckmut (1482-96); Johann Reger (1486-99).
1474. Marienthal: *Fratres clerici vitae communis* (*Breviarium Moguntinense*, March 12, 1474).
- 1474-99. Lübeck: Lucas Brandis (1474-99).
1475. Breslau: Caspar Elyan (*Statuta synodali*, October 9, 1475).
1476. Rostock: *Fratres Domus horti viridis ad S. Michaelem* (*Lactantius*; Opera, April 9, 1476).
- 1477-85. Blauberger: Conrad Manck (Kalender, 1477).
1478. Schussenried: Aretino (Graculus et Poliscena, 1478).
- 1478-91. Bamberg: Johann Sensenschmidt (1478-91).
- 1478-99. Reutlingen: Michel Greyff (1478-99); Johann Otmar (1482-95).
- 1480-1500. Magdeburg: Bartholomaeus Ghotan (1480-83); Moritz Brandis (1491-1500).
- 1480-1529. Leipzig: Conrad Kachelofen (1480-1516); Marcus Brandis (1481-90); Martin Landsberg (1492-15); Gregorius Böttiger alias Werman (1492-97); Arnold von Cöln (1493-96); Melchior Lotter (1495-15); Wolfgang Stöckel (1495-1520); Jacob Thanner (1495-1529).
- 1480-1500. Memmingen: Albrecht Kunne (1480-1500).
- 1480-89. Urach: Conrad Fyner (1480-89).
- 1482-99. Metz: Johannes Collin and Gherardus de Novi Civitate (1482); Caspar Hochfeder (1499).
1482. Erfurt: Paul Wider von Hornbach.
1482. Passau: Benedict Mayr.
- 1482-95. Würzburg: Georg Reyser (1482-95).

³ Concerning this item, see: V. Jagic: *Der erste Cetinje Kirchendruck vom Jahre 1494*. Wien, 1894.

- 1483-95. Heidelberg: Friedrich Misch (1483-90); Printers of Lindelbach's *Præcepta* [Johann and Conrad Hist] (1485-6); Heinrich Knoblochtrzer (1488-95).
 1484. Eichstätt. Michael Reyser (*Statuta synodalia*, 1484).
 1485-6. Münster. Johann Limburg (Johann Kerckmeister: *Comedia codri*, October 31, 1485).
 1486. Stuttgart. *Erwählung Maximilians* (after February 16, 1486).
 1487-99. Ingolstadt. Paul Lescher: *Rhetorica*, 1487; Johann Kachelofen (1499).
 1488-9. Stendal: Joachim Westphal (1488-89).
 1489-1523. Hagenau. Heinrich Gran (1489-1523).
 1491-1510. Hamburg: Johann and Thomas Borchard (1491-1510).
 1492-99. Freiburg i. Br.: Kilian Fischer [Piscator] (1492-96); Friedrich Riedrer (1493-99).
 1493. Lüneburg. Johann Luce (*Imitatio Christi*, May 22, 1493).
 1496. Offenburg. (Robertus Caracciolus: *Quadragesimale de peccatis*, January 5, 1496).
 1496. Zinna: Cisterciensis Ordinis Claustum (Psalter, 1496).
 1498-1501. Tübingen. Johann Otmar (1498-1501).
 1500-1520. Munich: Johann Schobsser (1500-1520).
 1500-1511. Pforzheim: Thomas Anshelm (1500-1511).

Familiarity with the names of these early printers, their periods of activity in various localities, the dates of their partnerships, dissolutions of partnerships and their strange migrations, is essential both to the collector and to the connoisseur of 15th century books.⁴ Even more important are the Roman and Venetian printers, veritable prime-movers of the Revival of Learning, whose teeming presses eventually turned out as many as 250 copies per edition in Rome, and 300-500 in Venice. Outstanding among the Roman printers were:

Conrad Sweynheym and Arnold Pannartz (second press), November 1467-1473; Ulrich Han or Udalricus Gallus (1467-78) who, during 1471-74 had as partner, Simon Nicolai Chardella; Joannes Phillippus de Lignamine (1470-76; second press 1481-84); Georg Lauer (1470-81); Adam Rot (1471-74); Theobald Schenkbecher (1472-73), who in 1473 became a partner of Wendelinus de Wila (1473-75); Johann Gensberg (1473-74); Johann Reinhard (1473-76); Georg Sachesel and Bartholomæus Golsch (1474); Johann Schurener (1474-77); Arnold Pannartz (1474-76); the press *Apud Sanctum Marcum*, probably run by Vitus Puecher (1475-76); Bartholomæus Guldinbeck (1475-87); Wolf Han, known as Lupus Gallus (1476); Johann Bulle (1478-79); Stephan Plannck (1478-1500); Eucharius Silber (1480-1500), who continued printing into the 16th century and was succeeded by his son Marcellus Silber; Georg Herolt (1481), some of whose publications have been assigned by Proctor to Silber; and Andreas Freitag (1492-95), who, in 1495-6, entered into partnership with Johann Besicken (1493-1500), who moved to Naples in 1500-1501.

The leading Venetian printers were:

Johannes de Spira (1469-73; 1476-7); Nicolaus Jenson (1470-80); Gabriele di Pietro (1472-78); Bartholomæus Cremonensis (1472-4); Jacobus Rubeus (1473-75); Filippo di Pietro (1475-81); Johann of Cologne and Johann Manthen (1474-80); Antonio Miscomini (1476-8); Adam von Rottwell (1476-82); Reynaldus de Norimago (1477-96); Leonard Wild (1478-81); Octavianus Scotus (1479-81); Erhard Ratdolt (1480-86); Antonius de Strata (1480-92); Johann Herbort (1481-84); Andreas Torresanus de Asula (1481-85); Michael Manzolus (1481); Baptista de Tortes (1481-1500); Johannes and Gregorius de Gregoriis (1482-

⁴ Dull as these chronologic lists may seem at first sight, they will be found to be of great practical value in assigning approximate dates to undated books, when the name of the printer happens to be known. The period of his activity will lie between the dates given above, from which a closer approximation may be made, in connection, with the date of the font of type used, from Haebler's *Typenrepertorium*. The above lists have been compiled from the elaborate studies of Proctor, Pollard and Reichling.

1500); Andreas Calabrinus (1484-92); Bernardinus Rizus (1484-1493); Johannes and Albertinus Rubens (1482-1500); Johann Hammann (1482-1500); Bartholomaeus de Zanis (1486-90); Bonetus Locatellus (1486-1500); Jacobus and Hieronymus de Paganinis (1487-1500); Hieronymus de Sanctis (1487-94); Bernardinus de Choris (1488-92); Christophorus de Pensis (1488-1500); Theodorus de Ragazonibus (1488-1500); Johannes Baptista Sessa (1489-1500); Malteo and Giovanni Capcasa (1489-95); Philippus Pincius (1490-1500); Manfredus de Bonellis (1491-1500); Petrus de Quarenghis (1492-1500); Simon Berilaqua (Vicenza 1491, Venice 1492-1500); Johannes Tacuinus (1492-15); Bartholomaeus de Ragazonibus (1492); Johannes Emericus de Spira (1492-1500); Bernardinus de Vitalibus (1494-15); Aldus Manutius (1495-1515); Otinus de Luna (1496-1507); Johannes Aluiscus (1497-1500); Simone de Luere (1489-91, 1497-1500).

Following the migration of Sweynheym and Pannartz to Subiaco (1465) and Rome (1467), printing went forward at a marvellous pace in the other Italian cities. Apart from Rome and Venice, presses were established in no less than 57 Italian cities during the next 30 years (1467-97). More than 150 of the printers were Germans. Proctor's Index numbers 4157 incunabula from Italian presses, as against 3232 for Germany and 998 for France.

Printing in France was started at Paris by

Ulrich Gering, Martin Crantz and Michael Friburger (Barzizius' Epistolae, 1470) and spread thence to Lyons (1473), Angers (1476), Toulouse (1476), Chablís (1478), Vienne, Dauphigny (1478), Poitiers (1479), Caen (1480), Rougement (1481), Chartres (1483), Chalons-sur-Marne (1483), Troyes (1483), Rennes (1484), Loudéac (1484), Tréguier (1485), Salins (1485), Abbeville (1486), Rouen (1487), Besançon (1487), Orléans (1490), Grenoble (1490), Dôle (1490), Gouppillères (1491), Angoulême (1491), Dijon (1491), Lantenac (1491), Tours (1493), Mâcon (1493), Nantes (1493), Cluny (1493), Limoges (1495), Provins (1496), Avignon (1497), Périgueux (1498), Perpignan (1500) and Valenciennes (1500). The most prominent of the early Parisian printers were Jean Du Pré (1481-1501); Jean Enguilbert and Geoffroy de Marnef (1481-1500); Antoine Caillaut (1483-1505); Gui Marchant (1483-1500); Georges Mittelhus (1484-1500); Louis Martineau (1483-98); Pierre Levet (1485-1502); Antoine Verard (1485-1500); Jacques Moeraert (1486-1501); Simon Vostre (1486-1500); Durand Gerlier (1487-1529); Pierre Le Rouge (1487-93); Philippe Pigouchet (1488-1501); Wolfgang Hopff (1489-1500); Michel Le Noir (1489-1500); Denis Meslier (1489-95); Denis Rocé (1490-1500); Antoine Baquellier (1491-93); Gilles Couteau (1491-1500); le petit Laurent (1491-1500); Jean Trepperd (1491-1500); Alexandre Aliate (1492-1500); Felix Baligault (1492-1500); Guillaume Eustace (1492-1528); Jean Lambert (1493-1514); Claude Jamar (1494-1500); Jean Philippe de Creuznach (1494-1519); Berthold Rembolt (1494-1500); Nicolas de la Barbe (1495-1500); Jean de Cowance or Coblenz (1495-1500); Antoine Denidel (1495-1501); Etienne Jehannot (1495-97); Jean Petit (1495-1500); Michel Toulouse (1495-1503); André Borard (1496-1531); Jean de Coulonces (1497-1503); Thielman Kerver (1497-1522); Jean Richard (1497-1500); Robert de Gourmont (1498-1500); Pierre Le Caron (1498-1500); Jean Poltevin (1498-1500); Georges Wolf (1498-1500); Jean Mérausée (1499-1514); Gaspard Philippe (1499-1512); and Jean Frelon (1501-28).

In the matter of collecting, identifying, and cataloguing French incunabula, it is also important to know the periods of activity of the Lyonnaise printers, viz..

Nicolas Philippi alias Pistor alias Müller (1477-88); Jean Siber (1478-1504); Pierre Le Masson and Boniface Jean de Villa Veteri (14.. 1482-1500); Gaspard Orliun (1484-1500); Janon Carcair Balsarin (1487-1500); Jean Dupré (1487-1500); Michel Trechsel (1488-99); Jacques Maillet (1489-1500); Engelhardt Schulteis (1491-1500); Antoine Lambillon and Martin Sarrazin (1491-1500); Jean Fabri alias Faure alias Schmidt (1490-1500); Pierre Maréchal and Barnabé Chaussard (1492-1500); Nicolas Wolf (1492-1500); Martin Havard (1493-1500); Jean de Vinzle (1493-1500); Jacques Arnoullet (1495-1504); P. Reberget alias Lardillon (1495);

Jacques Suigo (1496-1500); Claude Gibolet (1496-1503); Jean Klein alias Schwab (1498-1500); Jacques Saccon or Zachone (1498-1500) and Guillaume Boisson (1498-1504). At Poitiers were Jean Bouyer and Guillaume Bouchet (1492-1500); at Rouen, Martin Morin (1484-1500), Guillaume Le Tailleur (1485-91), Jean Le Bourgeois (1488-99), Jacques Le Forestier (1488-1500) and Jean Richard (1489-1500); at Toulouse, Henri Mayer (1484-96).

The incunabula published by these printers are usually identifiable by very ornate pseudo-heraldic devices, usually giving their names frankly in the vernacular. These devices, some beautiful, some grotesque, satirical, *fratzenhaft*, may be studied with edification or amusement in the charming album which M.-Louis Polain⁵ has made.

Of the Swiss printers, the most important to the bibliographer are those of Basel, *viz.*:

Michael Wenssler (1472-91); Bernard Richel (1474-82); Martin Flach (1475-84); Berthold Ruppel (1477-1500); Johann Amerbach (1481-1513); Johann Besicken (1482-3; Roman period 1493-1500); Peter Kollicker (1484); Nikolaus Koeler (1486-1510); Jacobus Wulff von Pforzheim (1488-1504); Michael Furter (1490-1517); Johann Frober (1491-1527) and Johann Bergmann de Olpe (1494-99).

Printing in English was begun by William Caxton (1422?-91), who, after the custom with Kentish lads, was apprenticed to a London mercer (1438). In 1446, he established himself in Bruges (Belgium), where he soon became so successful and prominent in business that by 1468-9, he found leisure to begin an English translation of Raoul Le Fevre's *Recueil des Histoires de Troye*. This he completed at Cologne 1471 and published as "The Recuyell of the Histories of Troye," at the press of Colard Mansion (Bruges) in 1475. At this time, Caxton was 53 years old and destined to devote the remaining fifteen years of his life to the publishing business. In 1474-75, he completed a translation of Jacobus de Cessoli's *Ludus scacchorum* as "The Game and Playe of Chesse," which was also published from the Mansion Press in 1475. In 1476, Caxton left Bruges for London and on November 18, 1477, published at Westminster the first book to be printed in England, *viz.*, "The Dictes and Sayings of the Philosophers," a translation of *Les dits moraux des philosophes* by Earl Rivers, with a prologue and a chapter "touchyng wymmen" by Caxton. During the next fourteen years, Caxton translated some 21 French romances and printed nearly 80 books, some of them passing through two or three editions. These include the great black-letter edition of Chaucer's

⁵ M.-Louis Polain: *Marques des imprimeurs et libraires en France au XVe siècle*. Paris, E. Droz, 1926.

Canterbury Tales (1478), now so highly prized by the cognoscenti, Caxton's own translations of Cicero on *Old Age and Friendship* (1481) and of *Reynard the Fox* (from the Dutch, 1481), the *Speculum or Mirror of the World* of Vincent de Beauvais (1481), Gower's *Confessio Amantis* (1483), Aesop's *Fables* (1484), Malory's *Morte d' Arthur* (1485), a second edition of *Canterbury Tales* (1485), two editions of the *Golden Legend* of Jacobus de Voragine (1483, 1487) and the *Ars moriendi* (The Art and Craft to know well to die, 1490). Through these avocations, Caxton became deservedly popular at the courts of Edward IV and Richard III, and his own translations played no small part in establishing a norm of idiomatic written English. His most famous medical publication was the *Governayle of Helthe* (1489), which was reprinted in facsimile by William Blades (London, 1858).

All of Caxton's apprentices and assistants—Wynkyn de Worde, Richard Pynson, Robert Copland, William de Machlinia and Peter Treveris—became famous English printers, particularly of medical books and pamphlets. From the press of Jan van Wynkyn de Worde (—1534), an Alsatian who succeeded to Caxton's business, came John of Trevisa's English translation of Bartholomaeus Anglicus in 1495, a Prognostication for 1498 (1497), an English *Ars moriendi* (1497), Garlandia's *Equivoca* (1499) and *Synonyms* (1500), and the *Judycvall of Urines* (circa 1512). Richard Pynson (—1530), a Norman by birth, published a *Book of Cookery* (1500), an undated English version of the *Ars moriendi* and Linacre's famous Latin versions of Galen *De naturalibus facultatibus* (1523), *De pulsuum usu* (1523) and *De symptomatum differentiis* (1524). William de Machlinia (circa 1482-90), who came from Mechlin, Belgium, published the *Liber aggregaciones* and *Secreta mulierum* of Albertus Magnus and three separate editions of an English version of the pest-tract (1485) ascribed to Canute, Bishop of Vesteras and which Sudhoff and Klebs have allocated to Jean Jasme (Johannes Jacobi). Robert Copland is best remembered by his translations of Aristotle's *Secret of Secrets* and of Guy de Chauliac (*Questionary of Cyrurgycns*, 1541) or his rhymed satirical dialogue with the porter of St. Bartholomew's Hospital ("The Hye-Way to the Spytell House," circa 1535). These early printers were followed by such men as Robert Wyer (circa 1530-56), who succeeded to Pynson's business and John Siberch, who set up the first press at Cambridge (1521), from which came the prized first edition of Linacre's translation of Galen *De temperamentis* (1521), so rare that Payne reprinted it in facsimile in 1881 and even Osler could never acquire a copy.

All in all, Gordon Duff lists some 431 English incunabula, of which Caxton and his followers printed a considerable part. As many of these early publications were destroyed in the Great Fire of London (1666), the remain-

ders are costly, highly prized and much sought after by collectors on account of their excessive rarity.

Spanish and Portuguese incunabula are of special interest to collectors on account of their excessive rarity and the high prices they fetch in the open market.

In 1833, a rare little book by Bartholomaeus Mates was unearthed, bearing the title *Pro condendis orationibus juxta grammaticas leges* and purporting to be an issue of the press of Johannes Gherling, a German, at Barcelona on October 9, 1468. Barcelona was then hailed as the starting point of printing in Spain. But as the only other books known to be printed by Gherling bear the dates 1494 and 1496, it is highly probable that the above date is a bit of careless typography, lacking perhaps an additional X or more, so that the palm of priority still remains with Valencia (1474) rather than with the Catalan capital. The first book to be printed in Portugal was one of the Jewish incunabula, a Pentateuch of June 6, 1487, published at Faro. It had been preceded by some 47 other incunabula in Jewish type, beginning with a Pentateuch of February 5, 1475, published at Reggio Calabria by Abraham Garton, and of these, 43 were printed in Italy. An accurate list of 101 Jewish incunabula, prepared by Joseph Jacobs (1904), indicates that during 1475-94, 81 were printed in Italy, 9 in Spain and 11 in Portugal. The outstanding medical item is the Hebrew version of the *Canon* of Avicenna, published by Azriel ben Josef (Azriel Günzenhauser) at Naples on November 9, 1491. The Spanish printers excelled in stately black-letter typography, notably in the edition of Lanfranc's *Cirurgia menor* (Seville, 1495) in the Surgeon General's Library, which rivals the Caxton black-letter Chaucer of 1478. What we know of Iberian (Spanish and Portuguese) incunabula is almost entirely due to the solid performance of Konrad Haebler, who is also the outstanding authority on early Spanish printers. The earliest was Lambert Palmart at Valencia (1474), who was followed by:

Matthew of Flanders at Saragossa (1475) and others at Seville (1477), Tortosa (1477), Lerida (1479), Salamanca (1481), Zamora (1482), Burgos (1485), Mallorca (1485), Toledo (1486), Murcia (1487), Coria (1489), Pampelona (1489), San Cugat del Valls (1489), Barcelona (1491), Valladolid (1492), Monterey (1494). Many of these, notably Lambert Palmert (1474), Nicholas Spindeler (Tortosa, 1477), Henrich Botel (Lerida, 1479), Cristobal Cofman. (Valencia, 1484), Paul Hurus (Saragossa, 1485), the quatuor alemani (1490) and Meinhard Ungut (1491-2) at Seville, Johann Rosenbach (Barcelona, 1492) and Peter Hagenbach (Valencia) 1493), were Germans.

Most of the Spanish incunabula are religious in character and content. The rest are either astrological or philosophical (commentaries on Aristotle, etc.), containing, here and there, matter relating to medicine, and of such matter the medical literature of the Middle Ages was largely made. It must be borne in mind that, in this period, medicine (*physica*) was regarded by the learned as a branch or phase of philosophy. It was therefore rationalized medicine, reasoned out from *a priori* hypotheses, among which what Singer calls the "astrological clue" was

a prime factor. Progress in this period was mainly in the direction of surgery and sanitation, trends determined in advance by the crying needs of the battlefield and of areas devastated by epidemic diseases. To those who think and feel as modern people (Charles Reade's *soyons de notre siècle*), the most remarkable medical publication of the Middle Ages were, therefore, the great treatises on surgery (a stately line of valuable books) and the tracts on plague, leprosy and syphilis. Yet, in spite of the crabbed, contracted Latinity and the diffuse, woolly syntax of the texts, the printed books and pamphlets of the Middle Ages have been more carefully identified, catalogued and studied, by and large, than those of any other period. Proctor says that the total output of the 15th century presses amounted to no less than 20 million copies, of which, alas! but few remain. It was about the end of the 17th century, when Beughem printed his *Incunabula typographica* (1688), that book-fanciers began to sense their importance as "cradles of typography" and their prospective value as rarities, that fillip to human cupidity and envy which has ever been the leading motive among those who collect unusual things. The literature which has since accumulated about incunabula is of appalling variety and extent and it now remains to give some account of the bibliographers of 15th century books and the methods employed in cataloguing them.

When a new book or pamphlet comes into a public library, fresh from the press, the first duty of the accession clerk is to examine the item carefully as to possible imperfections, such as defective pages or signatures, or malpositions of the same, in which case the book is returned to the publisher or agent, to be replaced by a perfect copy. The cataloguer must then ascertain the identity, full name and date of birth (or death) of the author, which is entered at the top of the author-card, with the title-page in full, the size, pagination, number of plates or illustrations, place of publication, publisher and date of publication given in succession below. This simple formula is sufficient to identify almost any book or pamphlet of recent

vintage, for the sufficient reason that modern mass-publication is mechanical manifolding or multiplication, like that of a newspaper, in which the chances of dissimilarity are reduced to a minimum. But machinery is just as apt to jam or run amuck as a machine-gun and even the most reliable presses or binding apparatus will sometimes turn out items with defective or misplaced pages or signatures. It was due to differences and defects of this kind in the publications of the 15th century printers that the modern technique of cataloguing the incunabula was devised. The aim was to describe the item in such wise that it would be absolutely identifiable as such, like a particular species or variant of a species in natural history. Could we conceive of unusual copies of such rare modern items as Edgar Poe's maiden effort or Peacock on Malformations of the Heart to be indentifiable by defects or differences of this kind, we should begin to localize and appraise such items in precisely the same way. Before the palmy days of Roman and Venetian printing, the early publishers turned out their books in small successive job-lots, some of them issued in the same year, and none of these lots were exactly alike. Hence arose the necessity of identifying and localizing each lot, page by page, as a particular species (or output) of a definite genus (or press).

The first cataloguer of incunabula on a big scale was Michel **Maittaire** (1668-1747), a French youth driven to England by the revocation of the Edict of Nantes who, at the age of 14, obtained a King's scholarship at Westminster School (1682). He came under the celebrated Dr. Busby, then head-master, who "kept him to the study of Greek and Latin some years longer than usual." The lot of students in those days is commemorated in the leering verses of Hudibras—

"Was not young Florio sent to school
His flame for Biancafior' to cool,
Where pedant made his pathic bum
For her sake suffer martyrdom?"

and Dr. Busby's application of birch to "the seat of the

Muses" is said to have been more ferocious than most. But Maittaire evinced his gratitude, none the less, by later compiling a Greek accidence and an English grammar for the use of the school. He became a "canoneer" student at Christ Church, took M.A. degrees at both Oxford (1696) and Cambridge (1708), was appointed second head-master of Westminster School (1695), but resigned in 1699, to keep a private school and wound up his career as tutor to Lord Chesterfield's lumpish son. Dr. Johnson defined Maittaire as "puzzle-headed" and devoid of genius; and Pope took a sly shot at him in the MS. of *Dunciad*—

"On yonder part what fogs of gathered air
Invest the scene, there museful sits Maittaire."

These lines were suppressed at the instance of Maittaire's patron, the Earl of Oxford, and, with reason, for Maittaire, as scholiasts go, was a man of some parts. He accumulated a fine library, rich in Aldines and Elzeviers, which was sold in 1748 at a London auction lasting 44 evenings; and he is memorable as the editor of the series of Latin classics in duodecimo, published by Jacob Tonson and Watts in 1713-19. His greatest work is his five-volume *Annales typographici* from the invention of printing to the year 1664 (1719-41), which begins with the block-letter *Ars moriendi* and 21 other undated publications of this type, passing thence to the dated Fust and Schoeffer Psalter of 1457, the Mainz Catholicon of 1460 and so on in chronologic order, down to 1664. Curiously enough, the Maittaire entries are as terse and simple as those latterly standardized by Reichling, Collijn, Klebs, the Berlin organization and all recent cataloguers of 15th century books. Collateral information is given below in the footnotes. Typical Maittaire entries are:

PLINII NATURALIS HISTORIA: *per Johan de Spira*, fol. Venetiis, 1469.

MUNDINI ANATOME omnium humani corporis interiorum membrorum: *per ANTONIUM de CARCANO*, fol. Paduae, 1478.

Albert Magn. de Animalibus: *per Simonem Nicolai de Luca*. fol. Romae, 1478.

Very few of the medical incunabula now familiar to col-

lectors are to be found in Maittaire's lists, and, as will be apparent from the above, his methods of entry, abbreviation, capitalization and exploitation of fonts of type are not standardized but irregular and *à capriccio*, or, in Dr. Johnson's apt phrase, "puzzle-headed." Maittaire was followed by Michael Denis, who published a supplement to his lists (Vienna, 1789), and by George Wolfgang Panzer (1729-1805), a country parson from Sulzbach (Bavaria), who became senior pastor of the Sebaldkirche at Nuremberg (1772). Panzer made a study of the different editions of the Lutheran Bible from 1517 to 1581 (1783-91), listed the known portraits of celebrities (1790-1801) and issued, during 1788-1805, his *Annalen* of German literature from the invention of printing to 1526, and later his *Annales typographici*, in 11 volumes (Nuremberg, 1793-1803). Panzer's entries, like those of Proctor and Pollard (British Museum and Bodleian) are arranged by places of publication in alphabetic order, and combine all information gleaned about the successive items in one paragraph, with references to Maittaire and lesser known compilers at the end. Examples are:

X ANTVERPIAE

2. *Practica medicinae que thesaurus pauperum nuncupatur* (PETRI HISPANI) *Antiverpie, per Theodorum Martini* 1476. die 23 Maii fol. *Viss. p. 5. Denis p. 69. Omisit hanc edition. March. in diction artic Martens p. 16.*
40. Physiologus THEOBALDI Episcopi de naturis animalium. *Antverpiae.* 1487. 4°. *Bibl. Goetting.*
56. ALBERTI MAGNI aliorumque opuscula nonnulla. *Antverpiae per Garardum Lceu* 1489. 4°. *Maitt. p. 56. Viss p. 30.*

With the advent of Ludwig Hain (1781-1836), an obscure private tutor in Munich, who eked out a living for 24 years (1812-36) as one of the editors of the Brockhaus *Conversationslexikon*, incunabula came to be identified and catalogued like species of animals and plants in natural history. During the last decade of his life (1826-36), Hain occupied himself with the compilation of his *Repertorium bibliographicum*, in four volumes (Stuttgart & Tübingen, Cotta, 1826-38), an alphabetical, numbered catalogue of 16,299 incunabula by authors, the most complete and re-

liable reference book of the subject prior to the inception of the great Berlin Catalogue. Hain's Repertory is based upon the treasures of the Munich Library. Each item inspected by himself is indicated by a star. A list of printers by places of publication, in alphabetical order, is appended at the end of the last volume, which Hain had brought up to item 16,082 (Uguition) at the time of his death, to be completed by subsequent hands. To realize the labor and devotion which Hain brought to his task, it is only necessary to cite one of his typical entries, which are now indicated in all subsequent catalogues by the Hain numerals:

* 1703. — — *F. I a tit.*: ARISTOTELIS || De natura animalium: libri novem. || De partibus animalium: libri quatuor. || De generatione animalium: libri quinque. || *Interprete Theodoro Gaza. F. 2a (c. sig. aii)*: HAEC SVNT CAPITA QVAE PRIMVS DE NATVRA ANIMALIVM LIBER || CONTINET. *F. a tabulam excipit Theodori ep. ad. Sixtum IV. Pont. Max. F. 7a (c. sign. b et n i.)*: Aristotelis stragiritae (*sic*) de historia animalium. Liber primus: Interprete Theodoro. *In fine*: Impraesum (*sic*) Venetiis mandato & expensis nobilis uiri Domini Octauiani Scoti Ciuis Modoetiesis. || Die. VIII. Augusti, 1498. per Bartholameum (*sic*) de Zanis de Portesio. *Registr. et insign. typogr. f. r. ch. c. s. et ff. r. 62 r. non num. et 89 ff. num.*

With the above description in hand, it is possible to identify a given copy of this particular item beyond peradventure. True, one is sometimes baffled by the algebraic abbreviations which Hain employs, without deigning to give a key on his page 1, which plunges in *medias res* with 1. ABANO (Petrus de. Conciliator) differentiarum philosophorum et praecipue medicorum (published at Mantua in 1472). Up to 1895-8, in fact, collectors and identifiers of incunabula had to rely entirely upon catalogues written in Latin, which meant coping with the puzzling abbreviations employed by the earlier scholiasts. For nearly a century, Hain remained the essential *vade mecum*, and even to-day, this valiant war-horse of bibliography, reproduced in facsimile by reason of the prohibitive price attaching to the original, is the handiest in size and shape and otherwise indispensable.

In 1870, Henry Bradshaw (1831-86), a Londoner of Irish extraction who was a great Celtic scholar, cataloguer of the MSS. in the Library of the University of Cambridge

and ultimately its librarian (1867-86), published a classified index of the 15th century books in the De Meyer collection, sold at Ghent in November 1869. In this, the modern methods and the modern ideal of cataloguing incunabula were for the first time clearly outlined, *viz.*,

that they are best studied by arranging them under countries, towns and presses, that allocation of dates of publication to undated books will be always haphazard and conjectural until we make "an accurate and methodical study of the types used and habits of printing observable at different presses," and that "each press must be looked upon as a *genus* and each book as a *species*, and our business is to trace the more or less close connexion of the different members of the family according to the character which they present to our observation. The study of palæotypography has been hitherto mainly such a *dilettante* matter, that people have shrunk from going into such details, though when once studied as a branch of natural history, it is as fruitful in interesting results as most subjects."

Palæotypography had to wait for 35 years before it was established for the incunabula by Robert Proctor (1898-1903) and Konrad Haebler (1905-24), but the first step in the newer trend was the discarding of the quickset of Latinity, its contractions and abbreviations, for free exposition in modern tongues.

The genial idea of describing the peculiarities of catalogued incunabula in the vernacular was first conceived by an English lawyer, Walter Arthur **Copinger** (1847-1910), who was, at once the leading conveyancer of Manchester, the county palatine of Lancaster and outside London generally, a great collector of old Bibles, MSS. and early printed books, a learned and aggressive theologian, an expert in genealogy, heraldry and manorial history, an accomplished musician, playing several musical instruments and composer of a collection of 75 original hymn tunes. In 1895-1902, this versatile luminary of the law published his "Supplement to Hain's Repertorium" in three volumes, containing corrections of 7,000 of the Hain items and descriptions of (or references to) 6,619 incunabula not seen or described by Hain. Copinger's catalogue is again alphabetical by authors, with the Hain numerals attached to his individual corrections of Hain and a new set of (Copinger) numerals for the 6,619 items unknown to Hain. Copinger's last volume contains, as an appendix,

Konrad Burger's "Printers and Publishers of the 15th Century, with Lists of their Works," which are again tagged with the Hain numerals. An enlarged version of this valuable index, known as Burger's *Numercondordanz*



Walter Arthur Copinger
[1847-1910]

to Hain and Panzer, was subsequently published at Leipzig (1908), and is as important, in its field, as a concordance of the Scriptures or of Shakespeare. At this time, antiquarian dealers, as well as book-fanciers, had long since come to realize the prospective value of incunabula as financial investments, and some of their catalogues had already begun to romance in an irresponsible way as to presumable dates of the treasure troves listed, albeit without intention and from a certain well-meaning *Schwärmerei*. In consequence, some of Copinger's corrections of Hain are not entirely accurate or reliable, by reason of the unquestioning faith which he seems to have accorded to

these enthusiastic marginalia; but his *opus magnum* is nevertheless of the kind recognized as indispensable and a remarkable achievement for a busy barrister.

In the late Dietrich **Reichling**, a gymnasial professor of Münster, whose *Appendices* to Hain-Copinger (Munich, 1905-14) followed closely upon the heels of Copinger, we have a bibliographer of singular accuracy, who, strange to say, has been often disregarded, if not disesteemed, by the *Fachleute*, so that little is known of his life. Reichling catalogued some 1,921 incunabula not known to Hain or Copinger and made many important corrections and emendations to the entries of both, with valuable lists of early printers by towns, and separate indices of the corrected Hain-Copinger items and of the items not described by either. Printed in parts at irregular intervals of time, Reichling's *Appendices* are difficult to handle, but as he always tags the Hain and Copinger items with the Hain and Copinger numerals, followed by the hitherto undescribed items with his own numerals affixed, we now write Hain 7868 or Hain-Copinger 7868 or Hain-Copinger-Reichling 7868, for a particular Hain item (7868) with the subsequent corrigenda made by Copinger and Reichling, while an item first described by Copinger or Reichling alone is tagged with the separate Copinger or Reichling numerals.

The wild guesses at possible or probable dates of publication which had sometimes been made by the most esteemed cataloguers, and more particularly in the trade-lists of antiquarian book-sellers, necessitated an intensive study of typography by places of publication and periods of time. The first to study 15th century typography, by and large, was Robert G. C. **Proctor** (1868-1903), a Devonshire man and Oxford graduate, who catalogued the incunabula in the Bodleian, joined the library staff of the British Museum, and in 1898-1903, issued his catalogue of its incunabula in 5 volumes, in which he gives photographic reproductions of the more important fonts of type employed. He was a profound student of early typography

and even printed the *Oresteia* of Æschylus (1904) and the *Odyssey* of Homer (1909) in a beautiful font of Greek, adapted by himself. He lost his life in an Alpine *crêvasse*, so that his projected catalogue of books printed in 1501-20



Robert Proctor
[1868-1903]

was only completed as far as the German items (1903). Proctor was followed by Dr. Konrad **Haebler** of the Royal Library of Berlin, who devoted immense labor to the composition of his *Typenrepertorium der Wiegendrucke* (6 vols. Halle and Leipzig, 1905-24), in which the specific fonts of type employed by the early printers are first analyzed and classified with reference to printers and places of publication and then arranged for reference in serial order, with specific numerals attached for purposes of identification and allocation of ascertained or approximate dates of usage. This work is one of the great and enduring monuments of scientific scholarship in the twentieth century, realizing Henry Bradshaw's ideal that the allocation

of dates of publication of undated books should be something more than conjectural. In all recent catalogues of incunabula, the Haebler numerals for type are as much in evidence as the Hain, Copinger and Reichling numerals



Konrad Haebler

for books. The actual or probable time of publication can now be allocated with confidence to most of the undated items. With the inception of Haebler's great work began also the ingenious practice of identifying unusual incunabula by employment, in the catalogues, of facsimile reproductions of the actual fonts of type which characterize the particular items. This method has been exploited, with rare perspicuity, in such elegant and beautiful catalogues as those of Voulliéme, Collijn, Klebs (*Pestschriften*) and the Prussian Commission.

The technique of cataloguing incunabula having been brought to ultimate perfection, we may now approach a group of investigators of more special type, *viz.*, scholars

to Gregorius Maximus, by M.-Louis Polain;⁷ and for incunabula owned in America, the *Census* compiled for the Bibliographic Society of America by Professor George Parker Winship and others (New York, 1919). A much larger group covers incunabula contained in individual local libraries, such as the catalogues compiled by Mlle. Pellechet from the public libraries of Dijon (1886), Versailles (1889), Lyons (1893) and Colmar (1895); Ernest Voulliéme from collections in Bonn (1894), Berlin (1906-22) and Treves



Léopold Victor Delisle
[1826-1910]

(1910); Isak Collijn from the University Library at Upsala (1907) and the Royal Library at Stockholm (1914-); those of the public libraries at Lübeck by Ludewig Suhl (1782), the Hague (J. G. Holstrop, 1856), Cologne (L. Emmen, 1865), Hannover (Eduard Bodemann, 1866), Budapest (A. Hillebrant, 1886), Copenhagen (J. A. Bolling, 1889-98), Brunswick (Heinrich Nentwig, 1891); Besançon (Auguste Castan, 1893), Oporto (A. H. de Silva Carvalho, 1904), Chantilly (Leopold Delisle, 1905), Hildesheim (C. Ernst, 1908-9), Leipzig (Otto Günther, 1910), Amsterdam (C. P. Burgier, 1919-23); of the University libraries at Bologna (Andrea Caronto, 1889), Cracow (W. Wislocki, 1900), Paris (E. Chatelain, 1902), Amsterdam (C. P. Burger, 1919-23), and Aberdeen (1925); the Bibliothèque Mazarine at Paris (Paul Marais and A. Dufresne de Saint Leon, 1893), the John Ryland's Library at Manchester (E. Gordon Duff, 1899), the John Crerar Library in Chicago (Axel Josephson, 1909), and the Surgeon General's Library, Washington (Klebs, 1916; McCulloch, 1918). Catalogues of

⁷ Following the innovation of Dr. Arnold Klebs, the numerals in the volumes of the Pellechet catalogue published after 1900 are now justly ticketed by the designation "Pellechet-Polain."

incunabula in private libraries began with the various *Bibliothecae* of Conrad Gesner (1545-83), and include such remarkable collections as those of Anthony Askew (London, 1775), Baron Rothschild (Paris, 1884-1920), Prince Dietrichstein (Berlin, 1884-1905), Henry Walters (Baltimore, 1906), Robert Hoe (New York, 1907), J. Pierpont Morgan (London, 1907), Prince Liechtenstein (Wien, 1910) and George Dunn (Oxford, 1923). Among the antiquarian catalogues consulted by the Prussian Commission are those of L'Art Ancien (Lugano), Joseph Baer & Co. (Frankfurt a.M.), J. Halle (Munich), Ulrich Hoepli (Milan), J. & J. Leighton (London), R. Lier & Co. (Milan and Florence), Maggs Brothers (London), Jacques and Ludwig Rosenthal (Munich), Sotheby (London), James Tregaskis (Caxton Head, London), W. M. Voynich (London) and T. O. Weigel (Leipzig, 1864). These are sometimes sumptuous in format and lavish in illustrations suitable for lantern-slide purposes, but not always reliable as to allocations of dates or statement of fact.



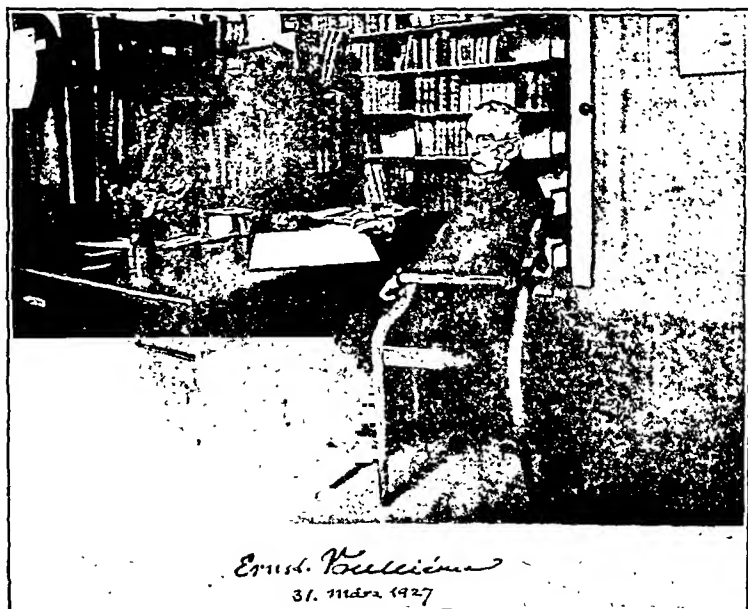
Marie-Louis Polain

Finally, some brief account must be given of the innumerable books published of late years by those who have done something more than merely identify, classify and catalogue the incunabula, who are, in fact, engaged in making a closer study of their actual content from various angles.

On the technical side, there are the collections of facsimiles of 15th century type made by Konrad Burger and Voulliéme (Berlin, 1892-1916), G. Dunn (Woolley Facsimiles, 1899-1905), Konrad Haebler (Typographie ibérique, 1901-2), the Type Facsimile Society (Oxford, 1900-1908), the Gesellschaft für Typenkunde (Leipzig, 1907); the individual studies of A. W. Pollard on title-pages (1891), illustrations (1893-4) and colophons (1905); of Paul Heitz on printer's devices (1892-1908), initial letters (1897), broadsides (1901-6), water-marks (1903-4), calendars (1905) and mediæval New Year Cards (1909) and the extensive literature on the fugitive sheets or broadsides, the individual wood-cuts and wood-cut illustrations, the printer's devices in different cities, the typography of music, the maps and the water-marks, concerning which the standard reference book is C. M. Briquet: *Les filigranes*. 4 vols. Paris, 1907. Important studies have been made of the mediæval botanies by F. Tornabene (Catania, 1840), of the Bibles by W. A. Copinger (*Incunabula Biblica*, London, 1892); the fables by G. C. Keidel (Baltimore, 1896), the weather predictions by G. Hellmann (1899), the single sheets by Heitz (1901-6), Collijn (1905-12) and the Prussian Commission (1914), the bookseller's advertisements by Konrad Burger (Leipzig, 1907), the arithmetics by E. C. Smith (Boston, 1908), the Books of Hours by E. Hoskins (London, 1901), P. Lacombe (Paris, 1907) and H. Bohatta (Vienna, 1909), of the liturgies by Bohatta (Vienna, 1911) and of the indulgences by P. F. Fournier, of the École des chartes (Paris, 1923). Histories of printing include the charming volume recently edited by A. C. Peddie (London, 1927), E. Gordon Duff's *Early English Printing* (London, 1896), Haebler (1897-1923) and Burger (1913) on Spanish and Portuguese printers, Wouter Nijhoff on printing in the Low Countries (1902-26), Voulliéme on the German printers (Berlin, 1916); and the many biographies of individual printers, from Gutenberg, Coster and Caxton (William Blades, 1861-3) to Günther Zainer (K. Estreicher, 1867), the Koburgers (O. von Hase, 1885), the Flacks (Charles Schmidt, 1893), Erhard Ratdolt (G. E. Redgrave, 1894), Ulrich Zell (J. Merlo, 1900) the R-printer (K. Dziatzko, 1894), Wynkyn de Worde (H. R. Plomer, 1925) and Henrich Steinhöwel (Karl Sudhoff, 1926). No less than four books have been written on Thierry Martens, the first printer of (Alost) Belgium and three on Antoine Verard, who flourished at Paris during 1485-1500.

It will be perceived from the above that more intensive labor has been devoted to the bibliography of incunabula than to any other class of books in existence and, in the face of such multifarious cataloguing, it had long been an ambition to compile a definitive list, "a new Hain," which should supersede all others and become a standard, reliable source of reference. Something of the kind was essayed by A. C. Peddie in his *Conspectus incunabulorum* (London, 1910-13), an index catalogue which attained to two initial volumes only and got no further than letter G. In the meanwhile, Friedrich Althoff (1839-1909), the Prussian Ministerial Director had called together a Commission of authorities in Berlin (November, 1904) to consider the possibility of a consolidated or *Gesamtkatalog*. To this

end, Konrad Haebler compiled his repertory of types (1905-24) and through the labors of Konrad Burger (died 1912), Ernst Voulliéme (Berlin), Ernst Freys (Munich),



Ernst Voulliéme

Adolf Schmidt (Darmstadt), Isak Collijn (Stockholm), Erich von Rath (Bonn) and other members of the Commission, an inventory of existing incunabula in Germany was made (1907-11), showing 145,484 specimens in 676 libraries. In 1910, a "Supplement to Hain" was published, cataloguing 400 incunabula hitherto undescribed. In 1914, the Commission issued a separate catalogue of broadsides or fugitive sheets. Just before the war, Sir William Osler visited the Commission and reported upon its activities at the Washington meeting of the Medical Library Association (May, 1914). Interrupted by the war, the first vol of the **Gesamtkatalog** was not published until 1927, volumes II-III following in 1926-28, covering 4,071 down to [pseudo-]Bernardus alone. These volu

finest thing thus far achieved in bibliography or the scientific description of books. They are beautiful in format and typography, well-nigh infallible as to accuracy, and while many of us will never live to see their completion, they have been speedily recognized as surpassing all other efforts in this kind. The entries are made as follows:

Under each author's name, brief biographical data are given, followed by a terse statement of the commonly accepted title of the item in question, with place of publication, printer or printers, and the ascertained, approximate or conjectural date. There follow the collation, size, pagination, signatures, fonts of type used, the description of the text by entries from the first, last and other pages identifying the item, after Hain's formula, with free exploitation of the fonts of type employed, and (below) notes on individual peculiarities of the item, check-references to the Hain-Copinger-Reichling, Pellechet, Voûlliémé and other special numerals and a list of important libraries possessing the item, alphabetized by cities.

With this magnificent catalogue at hand, it is possible to identify a given incunable or locate it as an unknown or undescribed species by simple inspection in minimum time. The *pièce de resistance* of this species of minute cataloguing will be, of course, the section on Bibles, as yet unpublished; but we have already a foretaste in the dissection of the undated Dutch (Utrecht), Swiss and Germanic editions of the *Doctrinale* of Alexander de Villa Dei (I, 485-509), based upon the exegesis of Reichling (Berlin, 1893).

Study of the medical incunabula began with Choulant's Handbuch of Bibliography (1828-41), his History of Anatomic Illustration (1852) and his study of the illustrated medical incunabula (1858), which, however, deal only with the items known to him. The first to attempt a complete check-list of the medical incunabula was that singular obstetrician and polyhistorian, John **Stockton Hough**, who, in 1889 issued an "Incunabula medica [prodrömus bibliographicus]" as a strictly private publication.

It is eccentric in get-up, with a title-page in Latin and a "*sommaire de la table*" in French, but otherwise not bad. In the copy presented to the S. G. O. Library, Hough lists 1626 items (1574 numbered, 52 inserted), of which 133 are later than 1500, 15 about or around 1500 and 416 undated, but now known to be, for the most part, prior to 1501 in date. The relative popularity of different writings in the period 1465-1500, as indicated by the number of items entered under each name, is: Albertus Magnus 66, Aristotle

59, *Regimen sanitatis* 55, Bartholomaeus Anglicus 53, Avicenna 44, Arnold of Villa Nova 28, Peter of Abano 26, Gentile da Foligno 23, Mesue 22; Guy de Chauliac, Jacopo da Forlì, Herbals and Herbolaria, *Hortus sanitatis*, Canutus (pest-tract), Pliny (Natural History) and Rhazes 21 each; Hippocrates 20; Symphorien Champier and Guaineri 19 each, Mundinus, Saliceto 17 each, Crescentius, Ketham and Savonarola 16 each, while of Gerson on self-abuse there are no less than 15 separate editions. These figures, corroborated mainly by corresponding Hain numerals, may be compared with the items of medical or biologic interest, thus far catalogued by the Prussian Commission, e.g., Albertus Magnus 138, Aristotle 85, Bartholomaeus Anglicus 24, Avicenna 13.

A great advance was made in **Sudhoff's** Catalogue of German Incunabula (Leipzig, 1908), namely a critical exegesis or interpretation of the 460 vernacular items minutely described by him. Declining to regard the incunabula as "a sporting fancy of bibliographers,"

Sudhoff regards it as an act of violence to fix the time-limit of publication at 1500, since a book of 1501-30 is often of equal importance for a true comprehension of the Middle Ages. Inasmuch as a book of this class was seldom printed at the instance of the author himself, but more often from a favorite MS. fished up from the great floating welter of MS. material and edited for or by the printer, the concept "author" really begins to disappear in the earlier mediæval literature, and many of these texts cannot be understood or authenticated except by comparison and collation with existing MSS. The study of incunabula is, in fact, the pathway into palæography, and both are essential to a just comprehension of mediæval medical literature. In succession, Sudhoff analyzes the German *Regimen sanitatis*, the treatises of Louffenburg (*Versehung des Leibs*), Ortolff von Bayerland, Tollat von Vochenburg, Metlinger, Eyb, Brunswick, Megenburg (*Buch der Natur*), Kaub (*Gart der Gesundheit*), the various dictionaries, herbals, pest and syphilis tracts, blood-letting calendars and writings on farriery, dietetics, bathing, personal hygiene, gymnastics, monsters, witchcraft and astrology, with reference to content and cultural significance, and has thereby set the pace for more recent studies of this kind, notably those on the bestiaries, herbals (Klebs), pest-broadsides (Heitz) and pest-tracts (Klebs). Through the investigations of Sudhoff and Haebler, the 100 broadside calendars for blood-letting, described by Heitz and Haebler (1905), have been increased to 150.

The next most important catalogue of medical incunabula is that prepared by Victor **Scholderer** for Osler's *Incunabula medica* (Oxford, 1923), which describes 217 books or pamphlets published between 1467 and 1480, the *terminus ad quem* selected by Osler for the more interesting medical items published in a period when some 350 printers were coming to be active in 111 different places (Pollard).

The list, chronologically arranged, begins with Rabanus Marus: *De sermonum proprietate* (Strassburg, A. Rusch, 1467?), the *Speculum* of

Rodericus Zamorensis (Rome, Sweynheym and Pannartz, 1468) and the *Historia naturalis* of Pliny (Venice, Johannes de Spira, 1459), the number of other items by date being roughly 1470 (2), 1471 (5), 1472 (14), 1473 (21), 1474 (25), 1475 (25), 1476 (21), 1477 (18), 1478 (30), 1479 (20), 1480 (29).

The volume is prefaced by Osler's presidential address on incunabula before the Bibliographical Society (January, 1914), perhaps the most charming thing ever written on the subject. Osler stresses the Arabian dominance of mediæval medical thought up to 1550, when Hippocrates and Celsus began to come into their own; the enormous number of blood-letting calendars on single sheets in the early days of printing, although "both physician and priest had broken with the astrological tradition" in phlebotomy long before the days of Gutenberg; the great popularity of Pliny, Aristotle, Avicenna, Mesue, Rhazes, the *Regimen sanitatis*, Guy de Chauliac, Saliceto, Arnold of Villanova, Silvaticus, Guainerius, Albertus Magnus, Bartholomæus Anglicus, Isidore of Seville, Michael Scot, Ferrari de Grado, Montagnana and Savonarola; the comparative sterility of the literature preceding the Revival of Learning and the subsequent emancipation of thought by Leonardo, Vesalius and Harvey. The following sentences are memorable:

"The mind of medicine is illustrated in its literature, written and printed. What men thought and how they acted are so expressed in the record that, given a page, an expert historian can tell the period as easily as the palæographer does a manuscript or a palæontologist a fossil. There would be difficulties the further back he went in civilized times. Just as certain types of fossils, usually lowly, persist from the Silurian, so dominant ideas and practices persist through the centuries. Long generations thought and acted alike in a uniformity so blank that only an expert could tell one from another. In the present whirlwind progress, not century from century, but decade from decade could be diagnosed in its literature. Take haphazard editorials in the *Lancet*, and you may trace within a decade the influence of Virchow, Pasteur, Lister, Koch and Ehrlich. Books are witnesses of the spirit—of the thoughts and hopes and deeds of all sorts and conditions of men . . . Revolutions are more rapidly effected in the arts than in the mind. A new process, a new discovery in practical science progresses more in a decade than does a new thought in ten. Harvey's demonstration of the circulation of the blood was scarcely accepted by his own generation, but within a few years after Jenner's discovery, the civilized world was vaccinated."

Thoughts of this kind were obviously activators of the next important land-mark in the interpretation of medical

incunabula—the recent study of the pest-tracts by Arnold C. Klebs and Karl Sudhoff (1925).

Klebs regards the second half of the 15th century as a period, sterile and devoid of intellectual heroism, if you will, but none the less astir with conspicuous activities of a social and political character which were a necessary prelude of the greater things to come. The evolution of a new social order, centering in the growing power of the bourgeoisie, the industrial classes and the press, the more mundane character of the university life of the period, are all reflected in the incunabula. And while it made little difference at the start whether a thought were circulated in manuscript or on the printed page, it is none the less true that printing made the dissemination of such matter more rapid, effective and extensive, and erroneous doctrine and falsity of reasoning more readily detectible. Thence came the famous critical spirit of Renaissance scholarship which made directly for more accurate thinking in science. The very illustrations in printed books were more exposed to criticism and susceptible of correction through being so much more in evidence, e.g., in the *Tabulae sex* or even the *Fabrica* of Vesalius. Since the real *terminus a quo* for the scientific literature of positive value is *circa* 1470, the convention fixing 1500 as the *terminus ad quem* is obviously arbitrary and maintained only for statistical purposes. The true criterion of an incunable is not so much, as Haebler opines, the internal evidence of a master's handiwork, for there were good and bad printers (master or apprentice) then as now. An incunable is rather definable by a patent imitation of the cursive handwriting of the manuscripts, whence an incunable with a title-page is unthinkable. Typographically, an incunable is an intermediary stage between the careful individualistic lettering of manuscript and the facile stereotypy of the output of later printers. To date, the business of identifying and cataloguing the incunabula has been at the expense of the study of their actual content, e.g., of important data buried in the cumbersome text, of rare editions based upon the most authentic texts, and of the prominent rôle of physicians as prime-movers of early printing. In most incunabula, the actual dates of printing, even to the day of the month, have been better ascertained than for many important historic events. The number of editions of a text indicates not only the zeal of physicians to improve them, but also the extent to which the book satisfied the mental hunger of the *cognoscenti* as well as the popular demands of the day. All this can and should be studied in subsequent editions down to 1543-50, when such items were buried in the great upthrust of scientific literature following the Reformation. Of the earlier incunabula, everything of medical value, Klebs thinks, was printed before 1485, which view is borne out by Scholderer's Catalogue of Osler's magnificent collection (1457-1480). The rest of the Klebs-Sudhoff pest-book consists of Klebs' definitive catalogue of pest-tracts before 1500, his exhaustive account of the origins of printing in the different cities and Sudhoff's Gothic study of the Ulm physician, Heinrich Steinhöwel (Steinheil), who wrote the most important of the German pest-tracts.

By 1910, upwards of 25,232 different incunabula had been catalogued, *viz.*, Hain 16,299, Copinger 6,619, Reichling 1,921, Prussian Commission (*Nachträge zu Hain*) 393. By March, 1920, the Berlin Commission had catalogued 37,639, of which 4,077 items have been described in the Berlin Catalogue to date. At this rate, it is estimated that

the *Gesamtkatalog* will near completion about 1955. Nothing daunted, Klebs has prepared a definitive catalogue of the known incunabula of medical and biologic import (upwards of 3,000 in number), which will soon be in the press. This will of course be an indispensable reference-book for medical historians, biologists, collectors and medical librarians, for like Osler's *Bibliotheca* and Sudhoff's German Medical Incunabula, it will contain collateral marginalia of biographic, bibliographic and scientific interest. For general cataloguing Klebs formulates the following simple rules:

A. For incunabula already described: 1. Author's name, authenticated by good precedent, i.e., family name in vernacular, if present practice; given name, in preference to town, or other descriptive epithets, as in Arnold of Villa Nova, Petrus Hispanus. 2. Main title in brief, as standardized by common usage or competent cataloguing. If a translation, give title in the particular language with name of translator, editor or commentator. 3. Titles of additional treatises in the volume, if any or not too many. 4. Collation (number of leaves), signatures, lines and columns to page, size of page, types used, kind of initials, illustrations (if any) and blank leaves, if not given by the other cataloguers. 5. Format (size). 6. Place of publication in vernacular of particular country. e.g., Venezia, *not* Venice or Venetiis, Lyon, *not* Lyons or Lugduni. 7. Names of printer and publisher of patron, usually in Latinized form. 8. Authenticated or conjectural date, including day of month, when known.⁸ 9. Bibliographic references to entries in Hain, Copinger, Proctor, *et al.* B. For undescribed incunabula: same as above, with 4a. Literary collation (synoptic content), as in Hain or Berlin Catalogue.

No exception can be taken to this simple line of procedure, which reduces the cataloguing of already described incunabula to virtual check-listing with reference to Hain or other numerals. As to place of publication, whether given in the original Latin, the vernacular of one's own country (as in the Berlin Catalogue) or the vernacular of the original printer's country (Klebs), it is important to know and memorize the following unusual Latin locatives, for identification, cataloguing or check-listing of whatever items come to hand:

⁸ In ascertaining dates, it is important to remember that *pridie* means the day before (a given day), *Kalendae* the first of the month in antiquity and the Middle Ages, but requiring special computation with reference to recent chronology; *idus* (*idibus*) the 15th of March, May, July or October and the 13th of January, February, April, June, August, September, November or December; and *nonae* the 5th of March, May, July or October and the 7th of the other months.

Andegavi—Angers	Norimbergae—Nuremberg
Argentinae—Strassburg	Novimagii—Nijmegen
Augustae Tiberii—Ratisbon	Novis—Novi
Augustae Trevirorii—Treves	Olomucensii—Olmütz
Augustae Vindelicorum—Augsburg	Ottoniae—Odense
Aureliani—Orleans	Oxoniae—Oxford
Avenione—Arignon	Paduae, Patavii—Padua
Babenbergae, Bambergae—Bamburg	Panormitii—Palermo
Barcinone—Barcelona	Papiae—Pavia
Bononiae—Bologna	Pataviae—Passau
Brixiae—Brescia	Perpiniani—Perpignan
Brugae—Bruges	Perusiae—Perugia
Budae—Buda Pest	Phorcai—Pforzheim
Cadomi—Caen	Pictavis—Poitiers
Caesaraugustae—Zaragoza	Pisciae—Pescia
Carnotii—Chartres	Pisis—Pisa
Cathelaunii—Châlons	Placentiae—Piacenza
Coloniae—Cologne	Prvini—Provins
Cracoviae—Cracow	Ratisponae—Ratisbon
Dantescli—Dantzic	Redones—Rennes
Daventriae—Deventer	Rostochii—Rostock
Delphis—Delft	Rothomagi—Rouen
Dolae Sequan—Dôle	Salmanticae—Salamanca
Engolismae—Angoulême	Senis—Siena
Erfordiae—Erfurt	Slesvicii—Schleswig
Farae—Faro	Spirae—Speyer
Forlivi—Forlì	Subiaci—Fubiac
Freibergae—Freiburg (Saxony)	Tarvisii—Treviso
Friburgii—Freiburg in Breisgau	Taurini—Turin
Fulginel—Folligno	Tergii—Gonda
Gebennis—Geneva	Terraconae—Tarragona
Gedanii—Dantzic	Tholosanae, Tolosae—Toulouse
Granatae—Granada	Toleti—Toledo
Hafniae—Copenhagen	Trevis—Troyes
Hagenovae—Hagenau	Turonii—Tours
Herbipolae—Würzburg	Ultrajecti—Utrecht
Hispali—Seville	Ulyssiponi—Lisbon
Holmae—Stockholm	Utinii—Udine
Lemovicii—Limoges	Valencianene—Valenciennes
Lipsiae—Leipzig	Valentiae—Valence
Lovanii—Louvain	Vallisoleti—Valladolid
Lucae—Lucca	Vesuntii—Besançon
Lugduni—Lyons	Viennae—Vienna
Lugduni Batavorum—Leyden	Viennae Austriae—Vienna
Marispolae—Merseburg	Vincentiae—Vicenza
Matisci—Macon	Vindobonae—Vienna
Mediolani—Milan	Vigueriae—Voghera
Moguntiae—Mainz	Viterbii—Viterbo
Monachii—Munich	Vratislaviae—Breslau
Mutinae—Modena	Westmonasterii—Westminster

For the cataloguing or check-listing of incunabula, I can offer only one original rule of my own, acquired from sufficient and memorable experience, *viz.*, either treat them surgically, in the sense of having them dusted, cleansed and disinfected beforehand; or don the surgeon's mask, gown and rubber gloves, plugging the nostrils with anti-septic cotton. On these old books is the accumulated filth of ages, which has been known to cause lingering sores, abscesses and eczematous eruptions, through some abrasion on the hands of S. G. O. employees; while the fine, impalpable dust engendered by the crumbling of the pages is bad for Schneiderian membrane, antrum and frontal

sinus. In the facetious phrase of Charles Dickens, no one should touch such books "with an ungloved hand." Some of them even bring to mind the witticism of Heine's little flower-girl of Paris, who classified flowers by their smell, pleasant or unpleasant—and "applied the same classification to men."

Collectors, as well as the medical profession, owe a special debt of gratitude to Mr. Charles Perry **Fisher**, the genial librarian of the College of Physicians of Philadelphia, who has made photostat copies of no less than 281 of the 373 incunabula in his collection, for the use of scholars, librarians and students of medical history. These are now available at small cost, whether to add to the literary wealth of libraries which cannot afford the now prohibitive prices put upon the rarer items (some of them even *introuvables*), or to prevent the wear and tear incident to thumbing and possible rough-handling of the original texts, which should now be regarded as museum specimens or shew-bread and kept apart under glass. What student of the incunabula would not prefer a neat, clean, handy photostat copy for workaday use, in preference to the sometimes dirty, unwieldy or otherwise unmanageable original, let alone the financial responsibility for loss or damage?

The subjoined check-list of 15th century books in the Surgeon General's Library comprises most known incunabula of medical interest and may therefore be of use to collectors. It includes not only those catalogued and printed under direction of the late Colonel Champe C. McCulloch, M.C., in 1916, but also those accumulated since the war. The first were carefully identified and ticketed by Dr. Arnold C. Klebs during 1915-16. Those of the second lot, accumulated since 1918, were selected for purchase by Mr. Felix Neumann, Assistant Librarian, S. G. O. and will be published in the *Annals of Medical History* (New York) with an appended list of items printed after 1500.⁹ by the Librarian, Colonel Percy M. Ashburn, M. C. To these gentlemen, I am indebted for advice, assistance, encourage-

ment and the free loan of valuable reference material, and to Dr. Klebs, in particular, for many careful corrections and critical evaluations in the check-list subjoined.

In this complete list, the data supplied as to total pagination, typography, printer's marks, initials, terminal woodcuts and illustrations, as also the Hain, Copinger, Reichling and other numerals in smaller type, are solely for purposes of identification of the particular item. Of abbreviations employed, B. M. C. refers to the British Museum Catalogue, G. W. to the *Gesamtkatalog der Wiegendrucke*. Hitherto unknown items (not identifiable by available published descriptions) are either tagged with compound Hain numerals, as in Klebs' identification of item 182 (Gerson) or are indicated by the ordinary clues (*Incipit* and *Ad finem*). An asterisk following a Hain numeral indicates that the item was personally examined and described by Hain from the Munich collection. A terminal F means that photostatic copies of the particular item are obtainable from Mr. Charles Perry Fisher, Librarian, College of Physicians of Philadelphia. The spelling and alphabetical adjustment of surnames and given names of authors follows the sequence of Hain numerals as closely as possible, with due regard for the improvements made by the Berlin Catalogue (the standard reference book of the future) and such later cataloguers as Collijn, Voullième and Klebs. Thus Benedictus de Nursia (Benedetto Riguardati), Guy de Chauliac or Henricus de Hassia (Heinrich Langenstein) are alphabetized under their given names, with references from supplied family names, while Ægidius Columna (Egidio Colonna) or Marsilio Ficino are listed under the given authentic surname. Not all the items are exclusively medical in content, but nearly all contain matter related to medicine or the history of medicine, e.g., 1, 2, 4, 25, 26, 28, 37, 38, 39, 108, 109, 128, 133, 148, 149, 165, 209, 232, 233, 254, 276, 328, 345, 397, 425, which are astrological or astronomical, 61, 164, 284, 285, 335, 336, which relate to dietetics and cookery, 40 and 140 which deal with palmistry. Items 112, 154, 235, 373, 441, are dictionaries or encyclopædias, items 13, 14, 15, 171, 213, 214, 221, 222, 263, are herbals, numbers 27, 30, 115, 123, 124, 125, 179, 210, 244, 273, 275, 413, 415, 430, 431, 432, are pest-tracts and 196, 252, 253, 334, 414, 423, 424, 442, relate to syphilis. Numbers 93, 95, 139, 158, 215, 216, 247, 337, are theological items of bibliographic or bibliophilic interest which have somehow found their way into the S. G. O. collection. The collection includes 17 items by Albertus Magnus, 10 of Peter of Abano, 9 each of Hugo Senensis and Savonarola, 8 each of Aristotle, Avicenna, Mesue, and the *Regimen Sanitatis*, 6 each of Arnold of Villanova, Gentile da Foligno, Pliny (Natural History) and Saliceto, 5 each of Matteo Silvatico, Michael Scott and Rhazes, 4 each of Bernard de Gordon, Gerson, Guaineri, Celsus, Jacopo of Forlì and Magnino of Milan, 2 each of Galen and Hippocrates, and 12 commentaries on Aristotle, a sidelight on the relative popularity of these medical authors in the Middle Ages, which is

⁹ While lists of the 16 century books (after 1500) were made by Maittaire (1719-41) and Panzer (1793-1803) they have never been completely assembled and collated to date. Choulant's *Handbuch der Bücherkunde der älteren Medizin* (Leipzig, 1828. 2. Aufl. Leipzig, 1841) is, of course, indispensable for the study of the major items, including the incunabula known to him. Proctor's Index, Vol. III (London, 1903) covers only items printed in Germany up to 1520. Among these are some amusing titles, suggesting the exuberant, mocking spirit of the Renaissance, e.g., Erasmus: *Der Krieg ist lustig den Unerfahrenen* (Strassburg, 1520); Geiler: *Das irrije Schaf* (Strassburg, 1514); Hartlieb: *De fide meretricum in suos amatores* (1505); *De generibus ebriosorum* (1516); *Hübsche Tragedia* (Augsburg, 1520); Olzarius: *De fide concubinatorum in sacerdotes* (Augsburg, 1506), the *Epistolae obscurorum virorum* and the entire output of Luther and Pfefferkorn.

confirmed by similar counts from all large collections. While 446 items are numbered here, there are 21 duplicates, usually bound up with some other volume itemized in the present check-list. In addition, the collection includes 6 items of doubtful date (after 1500), 21 allocated to 1501, 16 to 1502, 5 to 1503, 10 to 1504 and 8 to 1505. The total number of separate incunables (including duplicates) in the Surgeon General's Library is therefore 466, while of items of the *presqu' un incunable* class (up to 1505) the collection includes, with 6 undated items, at least 66. The growing interest in the medical incunabula is plain from the number of recent translations noted under important items in the appended list.



Isak Collijn

CHECK-LIST OF INCUNABULA IN THE ARMY MEDICAL LIBRARY, WASHINGTON, D. C.

1. **ABIOSUS** (Johannes): *Trutina rerum coelestium et terrestrium*. 26 l. 4°. [Venice, Johannes Rubeus, February 5, 1498.]
Hain-Reichling 25.* G. W. 7. Census 25. Roman type.
2. **ABRAHAM BEN EZRA** [-1167]. *De nativitatibus*. 36 l. 4°. Venice, Erhard Ratdolt, IX. Kal. Jan. 1485. (December 24, 1484.)
Hain-Copinger 21.* Pellechet 16. Proctor 4407. Voulliéme: Berlin 3804. G. W. 113. Census 21. Gothic type. F.
3. **ABULCASIM** [Abul-Quasim, 11th Century]. *Liber servitoris de praeparatione medicinarum simplicium*. [Translated by Abraham Tortuosensis. Edited by Simon a Cordo.] 64 l. 4°. Venice, Nicolaus Jenson, 1471.
Copinger 3450. Osler 7. Pellechet 411. Proctor 4075. G. W. 130. Census p. 8. Roman type. F.
4. **ACHILLINI** (Alexander) [1463-1512]. *De orbibus libri quattuor*. 52 l. fol. Bologna, Benedictus Hectoris Faelli, August 7, 1498.
Hain-Copinger-Reichling 72. Proctor 6638. Voulliéme: Berlin 2782. G. W. 191. Census 72. Gothic and Roman type.
Ægidius Columna: *See* Columna.
5. **ÆGIDIUS CORBOLIENSIS** (Petrus) [Gilles de Corbeil, 12th-13th Century] *De urinis* [*Carmina de urinarum judicii*]. 66 l. sm. 4°. [Padua], Matthaeus Cerdonis, July 12, 1483.
Hain-Copinger-Reichling 100. Pellechet 61. Proctor 6813. G. W. 269. Census 100. Gothic type. F.
6. I-I *De pulsibus*. [With commentary of Gentilis de Fulgineo. Editor: Venantius Mutius de Camerino.] 48 l. 4°. Padua, Matthaeus Cerdonis, January, 1484.
Hain 103*. Pellechet 64. Proctor 6815. Voulliéme: Berlin 3211. G. W. 268. Gothic type. F.
7. I-I *De urinis et pulsibus* [with commentary of Gentilis de Fulgineo. Editor: Venantius Mutius de Camerino.] 78 l. 4°. Venice, Bernardinus de Vitalibus, February 16, 1494.
Hain-Copinger 101*. Pellechet 62. Proctor 5522. G. W. 270. Census 101. Gothic type. F.
8. **ALBERTUS MAGNUS** [Albert von Bollstädt (1193-1280)]. *De secretis mulierum et virorum cum expositione Henrici de Saxonia*. 56 l. sm. 4°. [Venice, Adam von Rottweil, June 24, 1478.]
Hain 563*. Pellechet 368. Proctor 4419. G. W. 763. Census 563. Gothic type.
9. I-I The same. 34 l. sm. 4°. [Lyons, Michel Topié, *circa* 1488.]
Pellechet 374. G. W. 751. Gothic type.
10. I-I The same. 32 l. sm. 4°. [Paris, Antoine Caillaut, *circa* 1492.]
Burger 367. Pellechet 380. G. W. 755. Gothic type. Printer's device on title-page.
11. I-I The same. 44 l. sm. 4°. [Leipzig, Konrad Kachelofen, *circa* 1492.]
Hain 554*. Collijn: Upsala 44. G. W. 731. Gothic type.
12. I-I The same. 38 l. sm. 4°. Vienna, Johann Winterburg, [after 1500].
Hain 562*. Voulliéme: Berlin 2682. G. W. 765. Gothic type.
13. I-I *Liber aggregationis seu liber secretorum de virtutibus herbarum*. [Also: *De mirabilibus mundi*.] 32 l. 4°. [Speyer, Johan & Conrad Hist., *circa* 1483.]
Pellechet 343. Reichling: Suppl. 4. G. W. 622. Gothic type.

14. I-I The same. 21 1. sm. 4°. [Cologne, Heinrich Quentell, *circa* 1485.]
Campbell 82. Copinger 171. Proctor 1381. Voulliéme: Köln 39. G. W. 624. Gothic type.
15. I-I The same. 51 1. 4°. [Antwerp, Mathias van der Goes, *circa* 1491.]
Campbell 80. Copinger 175. Burger 418. G. W. 660. Gothic type.
16. I-I De praedicabilibus et praedicamentis. [Logica, lib. 1, 2]. 96 1. fol. Pavia, Christophorus de Canibus, [*circa* 1490.]
Hain-Reichling 490. Proctor 7093A. G. W. 675. Census 490. Gothic type.
17. I-I Philosophia pauperum [seu Summa naturalium seu Opus philosophiae naturalis. *Contains also*: Ægidius Columna; De regimine principum, I, 3, I-IX. Albertus Magnus: De virtute intellectiva.] 54 1. 4°. Brescia, Baptista de Farfengo, September 10, 1490.
Hain-Copinger 504. Pellechet 323. Proctor 7013. G. W. 711. Census 504. Roman type. Schematic woodcuts.
18. I-I The same. 50 1. sm. 4°. Brescia, Baptista de Farfengo, June 13, 1493.
Hain 505*. Pellechet 324. Voulliéme: Berlin 2836. G. W. 712. Census 505. Roman type. Schematic woodcuts.
19. I-I The same 54 1. sm. 4°. Venice, Georgius de Arrivabenis, August 31, 1496.
Hain-Copinger 506*. Collijn: Upsala 53. Pellechet 325. Proctor 4931. Voulliéme: Berlin 4127. G. W. 713. Census 506. Roman type, Schematic woodcuts. *F*.
20. I-I De mineralibus. 28 1. fol. Pavia, Christophorus de Canibus, June 18, 1491.
Hain 521*. Pellechet 337. Voulliéme: Berlin 3266. G. W. 687. Census 521. Gothic type.
21. I-I De anima. [*Also*: De intellectu et intelligibili.] 70 1. fol. Venice, Johannes & Gregorius de Gregoriis, November 7, 1494.
Hain-Copinger 494*. Pellechet 320. Proctor 4539. Voulliéme: Berlin 3881. G. W. 586. Census 494. Gothic type.
22. I-I De animalibus. 260 1. fol. Venice, Joannes & Gregorius de Gregoriis, May 21, 1495.
Hain 547*. Pellechet 341. Proctor 4541. Voulliéme: Berlin 3882. G. W. 589. Gothic type.
23. I-I De generatione et corruptione. 24 1. fol. Venice, Joannes & Gregorius de Gregoriis, June 10, 1495.
Hain-Copinger 517*. Collijn: Stockholm 24. Pellechet 333. Proctor 4542. Voulliéme: Berlin 3883. G. W. 613. Census 517. Gothic type.
24. I-I Summa de creaturis [seu Summa de quatuor coevis et de homine.] 198 1. fol. Venice, Simon de Luere for Andreas Torresanus, [December 19, 1498- February 16, 1499.]
Hain-Copinger 569*. Pellechet 384. Proctor 5621. Voulliéme: Berlin 4527. G. W. 779. Census 569. Gothic type.
Albohazen [Ali Abu al Hassan]. *See* Haly Albohazen.
Albucasis *See* Albucasis.
25. ALBUMASAR (Jafar) [Abu Mashar (805-886)] De magnis conjunctionibus [octo continens tractatus, Johannis Angeli correctione.] 118 1. sm. 4°. Augsburg, Erhard Ratdolt, pridie Kal. Apr. (March 31), 1489.
Hain-Copinger 611*. Collijn: Stockholm 35; Upsala 57. Pellechet 414. Proctor 1882. Voulliéme: Berlin 293. G. W. 836. Census 611. Gothic type.
26. I-I Flores astrologiae. 20 1. sm. 4°. Venice, Johannes Baptista de Sessa, [*circa* 1500].

Hain-Copinger 608*. Pellechet 413. Proctor 5593. Voulliéme: Berlin 4328. G. W. 839. Census 608. Gothic type. 79 woodcuts.

27. **ALCANIS** (Luis) [15th Century.] Regiment preservatiu e curatiu de la pestilencia. 14 l. 4°. [Valencia, Nikolaus Spindeler, circa 1490.]
Haebler 12. Klebs: Pest 1. G. W. 841. Census p. 9. Gothic type.
28. **ALCHABITIUS** [Abd al Aziz, Abdilazi, Al-Quabis] [circa 950.] Libellus isagogicus [ad magisterium iudiciorum astrorum interpretatus a Joanne Hispalensi]. 32 l. sm. 4°. Venice, Erhard Ratdolt, XVII Kal. Febr. (January 16). 1498.
Hain-Copinger 616*. Pellechet 417. Proctor 4382. G. W. 843. Census 616. Gothic type, Astrological diagrams and tables.
29. **ALEXANDER OF APHRODISIAS** [circa 200 A. D.] Problemata. [Latin translation by Georgius Valla. Also: Aristoteles: Problemata. Plutarch: Problemata. Edited by Johannes Calphurnius. Preface by Victor Pisanus.] 88 l. fol. Venice, Antonius de Strata, VIII. Kal. Dec.-III. Non. Jan. (November 24, 1488-January 3, 1489.)
Hain-Copinger 658*. Pellechet 439. Proctor 4594. Voulliéme: Berlin 3917. G. W. 860. Census 658. Roman type. F.
30. **ALEXANDER BENEDICTUS** [Alessandro Benedetti (1460-1525)] De observatione in pestilentia De febribus liber quintus. [with additions of Quintus Æmilianus]. 28 l. 4°. Venice, Joannes & Gregorius de Gregoriis, IV. Kal. Aug. (July 29), 1493.
Hain-Copinger 807*. B. M. C., V 344. Klebs: Pest 6. Pellechet 456. Proctor 4530. Voulliéme: Berlin 3874. G. W. 864. Census 807. Roman type. F.
31. **I-I Collectiones medicinae.** 8 l. sm. 4°. [Venice, Joannes & Gregorius de Gregoriis, circa 1493.]
Hain 806*. Pellechet 455. Proctor 4533. G. W. 862. Census 806. Roman type.
32. **I-I Diaria de bello Carolino**, [with additions of Quintus Aemilianus.] sm. 4°. [Venice, Aldus Manutius, after August 27, 1496.]
Hain 805*. Pellechet 454. Proctor 5552. Voulliéme: Berlin 4487. G. W. 863. Census 805. Roman type.
33. **ALEXANDER DE VILLA DEI** [Alexander Gallus (1170-)] Doctrinale [I-IV.] cum commento [Ludovici de Guaschis.] 84 l. sm. 4°. Venice, Manfred de Bonellis, January 28, 1494.
Hain-Copinger 754. Reichling: Doctrinale 106. G. W. 1023. Census 754. Gothic type.
34. **ALPHONSUS BONI HOMINIS** [Al-fasi or Al-fesi.] Libellus arabicus contra malos medicos. [Editor: Joannes Elisius Neapolitanus.] 8 l. sm. 4°. [n. p. 1500]
Census p. 10. Gothic and Roman type. Imperfect.
Alphonsus Toletanus. See de Vargas (Alphonsus).
35. **ANDREAE** (Johannes) [-1348]. Lectura super arboribus consanguinitatis et affinitatis. 8 l. fol. [Augsburg, Günther Zainer, 1473 *vel anterior*.]
Hain-Copinger 1020. Pellechet 635. Proctor 1541. Schreiber 3270. Voulliéme: Berlin 22. G. W. 1677. Census 1020. Roman type. Diagrams of trees of consanguinity on fol. 4b, 8a and 8b.
36. **I-I The same.** 10 l. fol. Louvain, Johannes de [Paderborn] Westphalia, 1480.
Hain-Copinger 1033. G. W. 1644. Census 1033. Gothic type. Full-page diagrams on fol. 4b, 8a and 8b.

37. **ANGELI (JACOBUS)** [15th Century.] *Tractatus de cometis*. 16 l. sm. 4°. [Memmingen, Albrecht Kunne, *circa* 1490.] Hain-Copinger 1099* (Hain 5341). Pellechet 758. Proctor 2807. G. W. 1891. Census 1099. Gothic type.
38. **ANGELI (JOHANNES)** [-1512]. *Astrolabium planum in tabulis ascendens*. 176 l. 4°. Augsburg, Erhard Ratdolt, XXVII Kal. Nov. (October 6?), 1488. Hain-Copinger 1100*. Pellechet 759. Proctor 1876. Voullième: Berlin 289. G. W. 1900. Census 1100. Gothic type. 443 astrological woodcuts and diagrams. Another copy with tinted figures.
39. I-I The same. 176 l. sm. 4°. Venice, Johann Emerich for Lucantonio Giunta, V. id. Jun. (June 9), 1494. Hain-Copinger 1101*. Pellechet 760. Proctor 5495. Voullième: Berlin 4454. G. W. 1901. Gothic type. 2 copies.
40. **ANIANUS** [*circa* 1300.] *Computus cum commento*. f 2a: ¶ Liber qui computos inscribitur. Una cu figuris 4 ma ¶ nibus necessariis [etc.] *Ad finem*: Liber copoti cum comento finit feliciter. 39 l. sm. 4°. Lyons, Matthias Huss, *circa* 1491-1500.] Not in Pellechet or *Gesamtkatalog*. Device of Huss on title-page. Gothic type.
Aphorismi Johannis Damasceni et Rhasis cum prognosticis Hippocratis qui fuerunt inventa in suo sepulchro in capsula eburnea. 24 l. sm. 4°. Bologna. Franciscus [Plato] de Benedictis for Benedictus Hectoris Faelli [1489]. See Maimonides (Moses): Aphorismi medici. sm. 4°. Bologna, 1489.] [Hain 10524*: 13905.] Gothic type.
41. **AQUINAS** (*Saint Thomas*) [-1274] *Commentum in octo libros physicorum Aristotelis*. 141 l. fol. [Venice, Nicolas Jensen), 1489. Hain-Copinger 1527*. Collijn: Upsala 1414. Proctor 4128. Census 1527. Gothic type.
42. I-I *Opuscula*. 318 l. fol. Milan, Benignus & Johannes Antonius de Honate, 1488. Hain-Copinger 1540. Pellechet 1092. Proctor 5908. Census 1540. Gothic type.
43. I-I *Super libros de generatione et corruptione Aristotelis, cum texta*. 34 l. fol. Venice, Bonetus Locatellus, for Octavianus Scotus, XI Kal. Jan. 1498-9. Hain-Reichling 1535. Pellechet 1082. Gothic type. F.
44. **ARCANA MEDICINÆ** [with additions by Johannes Bardijs Corso.] 72 l. 4°. [Geneva, Louis Cruse, *circa* 1498-1500.] Copinger 585. Pellechet 1105. Proctor 7822. G. W. 2315. Census p. 21. Gothic type.
45. **ARCULANUS** (Joannes) [Giovanni d'Arcoli, *circa* 1427-60.] *Expositio in Avicennæ canonis quarti fen primam*. 148 l. fol. Venice, Bonetus Locatellus, for Octavianus Scotus 1486. 45a — The same. [With additions by Arnulphus de Sacra Saxa.] 272 l. fol. Ferrara, Andreas Belfortis, January 24, 1489. Hain-Reichling 1552. Burger p. 340. G. W. 2316. Census 1552. Gothic type.
46. I-I The same. 148 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, VI. Kal. Nov. (October 27), 1496. Hain-Copinger 1553*. Collijn: Upsala 788. Voullième: Berlin 4193. G. W. 2317. Census 1553. Gothic type.
47. I-I *Practica seu expositio in IX librum Rhazis ad Almansorem*. 164 l. fol. Venice, Bernardinus Stagninus, November 12, 1493. Hain-Copinger 13899*. [G. W. *sub voce*: Rhazes.] Gothic type.

48. I-I The same. 178 1. fol. Venice, Bonetus Locatellus for Octavianus Scotus, September 18, 1497.
Hain-Copinger 13900*. Burger p. 482. [G. W. *sub voce*: Rhazes.] Census 13900. Gothic type.
49. de ARGELLATA (Petrus) [-1423]. Chirurgia. 128 1. fol. Venice, Benedictus Genuensis, August 9, 1480.
Hain-Reichling 1635. Pellechet 1161. Proctor 4596. G. W. 2321. Census 1635. Gothic type.
50. I-I The same. 132 1. fol. Venice, Joannes & Gregorius de Gregoriis, September 12, 1499.
Hain-Copinger-Reichling 1639. Proctor 5703. Voulliéme: Berlin 4563. G. W. 2324. Census 1639. Gothic type. 2 copies. F.
51. ARISTOTLE [-322 B.C.] De animalibus. [De historia (natura) animalium. De partibus animalium. De generatione animalium.] [Interprete Theodoro Gazio. Ludovicus Podocatharus auscultavit.] 252 1. fol. Venice, Johannes de Colonia & Johannes Manthen, 1476.
Hain-Copinger 1699*. Pellechet 1206. Proctor 4312. Voulliéme: Berlin 3741. G. W. 2350. Census 1699. Roman type. English translation by D' A. W. Thompson (Oxford, 1910).
52. I-I The same. 152 1. fol. [Venice, Simon Bevilaqua, *circa* 1495.] Hain 1698*. Pellechet 1205. Voulliéme: Berlin 4414-5. G. W. 2352. Census 1698. Roman type.
53. I-I. The same. 96 1. fol. Venice, Bartholomaeus de Zanis for Octavianus Scotus, August 9, 1498.
Hain-Copinger 1703*. Pellechet 1208. Proctor 5341. Voulliéme: Berlin 4259. G. W. 2353. Census 1703. Roman type.
54. I-I Opera [Latin.] Parts I-III. 122, 36, 104, fol. Augsburg, Ambrosius Keller, September 15-October 21, 1479.
Hain-Copinger 1658*. B. M. C., II, 361. Pellechet 1176. Proctor 1747-1750. Voulliéme: Berlin 195-197. G. W. 2335. Census 1658. Gothic type.
55. I-I Secreta secretorum [Liber de secretis.] 44 1. sm. 4°. [Reutlingen, Michael Greyff, *circa* 1483.]
Hain 1779*. Proctor 2721. Voulliéme: Berlin 1958, 5 G. W. 2487. Gothic type.
56. I-I- The same. 22 1. sm. 4°. [Antwerp, Matthias Van der Goes, *circa* 1488.]
Copinger 637. Proctor 9407B. G. W. 2484. Gothic type. Initial woodcut.
57. I-I Problemata. [Also: De vita et morte Aristotelis.] 48 1. 4°. [Cologne, Heinrich Quentell, *circa* 1493.]
Hain 1721*. B. M. C. I., 281. Pellechet 1220. Proctor 1410. Voulliéme: Berlin 1004. G. W. 2472. Census 1721. Gothic type. Title woodcut.
58. I-I The same. 44 1. sm. 4°. Paris, [Guy Marchant] for Alexandre [Aliate], April 4, 1500.
Copinger 625. Pellechet 1223, 1225. Reichling 35. G. W. 2476. Census 1722 bis. Gothic type (red and black).
59. ARNOLDUS DE VILLANOVA. [-1311]. De arte cognoscendi venena. [Also: Valascus de Tarenta. De epidemia et peste.] 42 1. 4°. Mantua, Johann Vurster & Thomas of Hermannstadt. 1473.
Hain-Copinger 7.* 1805*. Osler 41. Pellechet 6, 1307. Proctor 5384. Voulliéme: Berlin 3014. G. W. 2522. Census 7, 1805. Roman type. F.
60. I-I The same. 16 1 sm. 4°. [Rome, Bartholomaeus Guldinbeck, *circa* 1475-6.]
Hain-Reichling 1804*. Copinger 648. Osler 86. Pellechet 1306. Reichling 820. G. W. 2525. Roman type.
61. I-I [De vinis.] Büchlein von bereytung der Wein [Translated

- by Wilhelm von Hirnkofen]. 26 l. sm. 4°. Augsburg, Hans Bämmler, am Freitag nach Bartholomei (August 27), 1479. Hain-Copinger 1812*. Osler 167. Sudhoff 140. G. W. 2538. Gothic type.
62. I-I Breviarium practicae. 103 l. fol. [Pavia, Antonius Carcanus, *circa* 1485.] Colljn: Stockholm 103. Copinger 647. Voullième: Berlin 3238, 5. G. W. 2527. Census p. 24. Gothic type.
63. I-I The same. Practica medicinae. 76 l. fol. Venice, Baptista de Tortis, February 21, 1494-5. Hain 1801*. Proctor 4646. G. W. 2528. Census 1801, Gothic type. F.
64. I-I The same. 68 l. fol. Venice, Otinus de Luna, October 21, 1497. Hain-Copinger 1802*. Pellechet 1275. Proctor 5606. G. W. 2529. Census 1802. Gothic type. F. *See, also* Herbarius latinus, Regimen sanitatis.
65. ARTICELLA. [seu thesaurus operum medicorum antiquorum. Editor: Franciscus Argilagnes.] 216 l. fol. Venice, Baptista de Tortis, August 20, 1487. Hain-Copinger 1870. Copinger 696. Pellechet 1378. Proctor 4633. G. W. 2680. Census 1870. Gothic type.
66. I-I The same. [Re-edited with marginalia by Gregorius a Volpe.] 196 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, XIII Kal. Jan. 1493 (December 20, 1492). Hain-Reichling 1872. Pellechet 1379. Proctor 5040. Voullième: Berlin 4178. G. W. 2682. Census 1872. Gothic type. F.
67. ATHENAGORAS [*circa* 177 A.D.] De resurrectione [Translated by Marsilius Ficinus. *Also*: Pseudo-Plato: Axiochus. Translated by Marsilius Ficinus. Cebes: Tabula. Translated by Ludovicus Odaxius.] 14 l. sm. 4°. Paris, Guy Marchant for Jean Petit, August 18, 1498. Hain-Copinger 1907. Pellechet 1415. Proctor 8008. G. W. 2763. Census 1907. Gothic type. Device of Jean Petit on title-page.
68. AUCTORITATES ARISTOTELIS et aliorum philosophorum. [Propositiones universales]. 80 l. sm. 4°. [Treviso, Michele Manzolo, *circa* 1476.] Hain-Copinger 13413. Voullième: Berlin 4651. G. W. 2833. Gothic type. Augustinus (Aurelius) [354-430 A.D.]. *See* Pseudo-Augustinus.
69. de AUGUSTIS (Quiricus) [15th Century] Lumen apothecariorum [cum certis expositionibus noviter impressum]. 40 l. 4°. Venice, Johannes & Gregorius de Gregoriis, September 22, 1495. Hain 2120*. Pellechet 1597. Proctor 4546. Voullième: Berlin 3886. G. W. 3066. Gothic type. F.
70. I-I The same. 44 l. fol. [Lyons, Matthias Huss, *circa*, 1498.] Hain 2116*. Pellechet 1595. G. W. 3065. Census 2116. Gothic type.
71. AURELIUS VICTOR (Sextus). De viribus illustribus Romae. [C. Plinii secundi junioris liber illustrium virorum]. 32 l. sm. 4°. Florence, apud Sanctum Jacobum de Ripoli frater Dominicus de Pistora et [frater Petrus de Pisis], 1478. Hain-Copinger 2137. Pellechet 1610. Proctor 6101. Census 2137. Roman type.
72. AVENZOAR [1091-1162]. Taisir [*Also*: Antidotarium (Gami), translated from the version of Jacobus Hebraeus by Paravicinus. Averroes: Colliget (*Kullija*).] 108 l. fol. Venice, Joannes & Gregorius de Gregoriis, January 4, 1490-91. Hain 2186*. B. M. C., V, 341. Pellechet 1652. Proctor 4513. G. W. 3103. Census 2186 Gothic type. 2 copies. F.
73. I-I The same. [Edited by Hieronymus Surianus]. 108 l. fol.

Venice, Bonetus Locatellus for Octavianus Scotus, May 31, 1496.

Hain-Copinger 2187. Pellechet 1653. Voulliéme: Berlin 4193. G. W. 3104. Census 2187. Gothic type. Device of Octavianus Scotus.

74. I-I The same 104 1. fol. Venice, Otinus de Luna, X Kal. Jan. (December 31), 1497.

Hain-Copinger 2188*. Pellechet 1654. Proctor 5606. Voulliéme: Berlin 4522. G. W. 3105. Census 2188. Gothic type. F.

75. AVERROES. [1126-1198] Colliget [Kullija]. 116 1. fol. Ferrara ["Venice"], Laurentius [de Valentia] de Rubeis, et socii, October 5, 1482.

Hain-Copinger 2189*. Pellechet 1655. Voulliéme: Berlin 2871. G. W. 3107. Census 2189. Gothic type. Printer's device. See, also Avenzoar, Avicenna.

76. AVICENNA [-1037]. Canon [Al Quanun]. Libri I-V. [Translated by Gerard of Cremona. Also: Libellus de viribus cordis. Translated by Arnoldus de Villanova.] 130, 172, 132 1. fol. Padua, [Johann Herbort], August 19, August 27, October 27, November 6, 1479.

Hain-Copinger 2202*. Osler 180. Pellechet 1661. Proctor 6800. G. W. 3117. Census 2202. Gothic type. English translation of Book I by O. C. Gruner, London, 1930.

77. I-I The same. [Also: Cantica, with commentary of Averroes. Translated by Armengaud [Blasius] of Monte Pessulana.] 64, 64, 174, 88, 40 1. fol. Venice, Pierre Maufer, Nicolaus de Contugum cum sociis, 1482-3. Bound with the preceding.

Hain-Copinger 2203. Pellechet 1662. Voulliéme: Berlin 3921, 5. G. W. 3119. Census 2203. Gothic type.

78. I-I The same. 76, 78, 192, 104, 50 1. fol. Venice, Petrus Maufer cum sociis, June 10, 1486.

Hain-Copinger 2203*. B. M. C., V, 298. Pellechet 1664. Proctor 4602. G. W. 3120. Census 2205. Gothic type. Incomplete.

79. I-I The same. [Hebrew translation by Josef Lorki and Nathan Ham-Meati]. 5v. in 3. fol. Naples, Azriel ben Josef, 7. Kislew 252 (November 9, 1491).

Hain 2212. Fava 273. Jacobs 81. Pellechet 1670. Proctor 6736. Voulliéme: Berlin 3185. G. W. 3113. Census 2212. Hebrew type.

80. I-I The same. 190, 252, 190 1. fol. Venice, Simon Bevilaqua. July 20-November 21, 1500.

Hain-Copinger 2211*. Pellechet 1669. Proctor 5416. G. W. 3123. Census 2211. Gothic type.

81. I-I Liber canonis quartus de egritudinibus particularis. 142 1. fol. Venice, Baptista de Tortis, January 24, 1490.

Hain 2210*. Collijn: Upsala. 215. Pellechet 1667. G. W. 3124. Census 2210. Gothic type, with fragments of fen II-VII at end.

82. I-I De anima [Kitab as-sifa]. 52 1. 4°. Pavia, Antonius Carcanus, [circa 1485].

Hain-Reichling 2219. Proctor 7058. Voulliéme: Berlin 3247. G. W. 3111. Census 2219. Gothic type.

83. I-I De animalibus [Latinized by Michael Scot]. 54 1. fol. [Venice. Joannes & Gregorius de Gregoriis, 1500].

Hain-Copinger 2220*. Pellechet 1672. Proctor 4563. Voulliéme: Berlin 3899. G. W. 3112. Census 2220. Gothic type.

84. AVIENUS (Rufius Festus). Carmina [Codex Avieni, edited by Victor Pisanus] 122 1. sm. 4°. Venice, Antonius de Strata, VIII Kal. Nov. (November 25), 1488.

Hain-Copinger 2223-4*. Pellechet 1673. Proctor 4593. Voulliéme: Berlin 3916. G. W. 3131. Census 2223. Roman type. 38 woodcuts, one repeated.

85. **BAGELLARDO** (Paolo) [-1492]. *De infantium aegritudinibus et remediis*. 40 l. 4°. Padua, Bartholomaeus de Valdicoccho & Martinus de Septem Arboribus, April 21, 1472.
Hain 2244*. Osler 20. Pellechet 1688. Proctor 6756. Sudhoff: *Erstlinge der Pädiatrik* 1. G. W. 3166. Census 2244. Roman type. English translation by Herbert F. Wright in *Ruhrh. (J.): Pediatrics of the Past*. 8°. New York, 1925, 34-70. F.
86. I-I The same. 22 l. 4°. [Padua] Mattheus [Cerdonis] de Windischgretz, November 10, 1487.
Hain-Reichling 2245. G. W. 3167. Census 2245. Gothic type. F.
87. **BAPTISTA MANTUANUS** [Giovanni Battista Spagnola, Mantovano (1448-1516)] *De patientia [aurei libri tres. With additions by Helias Capreolus and Johannes Taberius]*. 116 l. sm. 4°. Brescia, Bernardinus Misinta, III. Kal. Jun. (May 30), 1497.
Hain-Copinger 2404* (2403). Pellechet 1810. Proctor 7041. G. W. 3304. Census 2404. Gothic, Roman and Greek types.
88. I-I The same. 118 l. sm. 4°. Basel, Johannes Bergman de Olpe, xvii, Kal. Sept. (August 17), 1499.
Hain-Copinger 2407. Pellechet 1813. Proctor 7783. Voulliéme: Berlin 618. G. W. 3307. Census 2407. Gothic, Roman and Greek types. F.
89. **BARBARUS (HERMOLAUS)** [1454-93] *Castigationes Plinii*. 160 l. fol. Venice, for Daniel Barbarus, 1493-4.
Hain-Copinger 2420*, Copinger 867. Pellechet 1823. Proctor 7422. Voulliéme: Berlin 4566, 5. G. W. 3341. Census 2420. Gothic, Roman and Greek types.
90. **BARTHOLOMAEUS ANGLICUS** (circa 1231]. *De proprietatibus rerum*. 220 l. fol. [Basel, Berthold Ruppel, circa 1470.]
Hain-Copinger 2499*. B. M. C. III, 716. Pellechet 1866. Proctor 7456. G. W. 3402. Census 2499. Gothic type. French translation (1372) by Jean Corbichon (Hain 2512-2519). English translation (1398) by John of Trevisa (Westminster, Wynkyn de Worde, circa 1495. Hain 2520).
91. I-I The same. 326 l. fol. [Heidelberg, Heinrich Knoblochtzter, XII Kal. Jun. (May 21), 1488.
Hain-Copinger 2507*. 8. Collijn: Stockholm 156; Upsala 244. Pellechet 1874. Proctor 3130. Voulliéme: Berlin 1198, 15. G. W. 3411. Census 2507. Gothic type. 2 copies, one with stamped pigskin binding by Caspar Kraft.
92. I-I The same 258 l. fol. Strassburg, Georg Husner [Printer of Jordanus], altera die post S. Laurentii (August 11), 1491.
Hain-Copinger 2509*. Pellechet 1875. Proctor 665. Voulliéme: Berlin 2445. G. W. 3412. Census 2509. Gothic type.
93. **BARTHOLOMÆUS DE CHAIMIS**. *Interrogatorium seu confessionale*. 138 l. fol. [Strassburg, Printer of H. Arimensis, circa 1475.]
Hain 2478*. Proctor 307. B. M. I, 79. Census 2478. Gothic type.
94. **BARTHOLOMÆUS DE PISIS**. *Epitoma medicinae*. 104 l. 4°. [Florence, Lorenzo Morgiani & Johann Petri, circa 1500.]
Hain-Copinger 2531. Pellechet 1896. Census 2531. Roman type. F.
95. **BARTHOLOMÆUS de SANCTO CONCORDIO**. [1250-1374]. *Summa de casibus conscientiae*. 192 l. fol. [Augsburg, Günther Zainer], 1475.
Hain 2528*. Pellechet 1893. Proctor 1546. Voulliéme: Berlin 24. G. W. 3453. Gothic and Roman type. Illuminated initials.
96. **BARTHOLOMÆUS SIBYLLA** [15th Century]. *Speculum peregrinarum quaestionum*. 264 l. sm. 4°. Strassburg, Johann Reinhard alias Grüninger, xvi, Kal. Sept. (August 19), 1499.
Hain-Copinger 14720*. Collijn: Upsala 257. Proctor 490. Voulliéme: Berlin 2307. G. W. 3460. Census 14720. Roman type. Woodcut.

97. **BARZIZIUS** (Christophorus) [*circa* 1400-1492]. *Introductorium ad opus practicum medicinae, cum commentario in IX librum Rhazis ad Almansorem*. [Edited by Johannes Antonius Bassinus. Corrector: Petrus Buzius]. 257 l. fol. Pavia, Antonius Carcanus for Octavianus Scotus, August 20, 1494.
Hain 2666*. Pellechet 1975. Proctor 7066. Voulliéme: Berlin 3246. G. W. 3672. Census 2665-6 Gothic type.
98. **BAVERIUS DE BAVERIIS**, [Joannes]. [-1480] *Consilia medica*. 162 l. fol. Bologna, Franciscus dictus Plato de Benedictis. November 5, 1489.
Hain-Copinger 2712. Pellechet 2010. Proctor 6589. G. W. 3739. Census 2712. Roman type.
Benedetti (Alessandro). See Alexander Benedictus.
99. **BENEDICTUS DE NURSIA** [Benedetto dei Riguardati, 15th Century] *De conservatione canitatis*. 140 l. 4°. Rome, Joannes Philippus de Lignamine, January 14, 1475.
Hain 11919*. Osler 83. Proctor 3397 A. G. W. 3818. Census 11919. Roman type.
100. I-I The same. [*Also*: Johannes Hispalensis: *De regimine sanitatis*]. 140 l. 4°. Bologna, Dominicus de Lapis, 1477.
Hain-Copinger 11920*. Osler 129. Proctor 6536. Voulliéme: Berlin 2735. G. W. 3819. Census 11920. Roman type. F.
101. I-I The same. 62 l. 4°. [Rome, Stephan Planneck, *circa* 1485.] Copinger 4444. Proctor 3768. G. W. 3820. Census 11917. Gothic type.
102. I-I The same. [*circa* 1447.] 54 l. sm. 4°. Rome, Stephan Planneck, quarto nonas maii (May 4), 1493.
Hain-Copinger-Reichling 11922. Copinger 4446. Proctor 3713. G. W. 3824. Gothic type. F.
- Benzi (Ugo) See Hugo Senensis.
103. **BEROALDUS** (Philippus) *Opusculum* [Declamatio an orator sit philosopho et medico anteponeendus. *Also*: Libellus de optimo statu et principe]. 40 l. 4°. Bologna, Benedictus Hectoris Faelli, December 13, 1497.
Cf. Hain-Copinger 2963*. Pellechet 2218. Census 2963. Roman type. Printer's device at end. F.
104. I-I [Heptalogus sive] Libellus quo sapientium sententiae discutuntur. 23 l. sm. 4°. Bologna, Benedictus Hectoris Faelli, December 18, 1498.
Hain 2974*. Pellechet 2227. Proctor 6640. Census 2974. Roman type.
105. I-I *De felicitate opusculum*, 28 l. sm. 4°. Bologna, Benedictus Hectoris Faelli, idibus aprilis (April 15), 1499.
Hain 2971*. Pellechet 2255. Proctor 6641. Census 2971. Gothic and Roman type.
106. **BIEL** (Gabriel) *Sermones Gabrielis de tempore*. 296 l. 4°. Tübingen, Johann Otman, (March 10, 1500).
Hain-Copinger 3185*. Klebs: Pest 8. Proctor 3234. Census 3185. Gothic type.
107. **BLANCHELLUS** (Menghus) *Quaestiones de primo et ultimo instanti*. 32 l. fol. Ferrara, Laurentius de Valentia [de Rubeis] et Andreas de Grassis, September 7, 1492.
Hain 3232*. Burger, p. 570. Census 3232. Gothic type. F.
Bollstädt (Albert von). See Albertus Magnus.
108. **BONINCONTRIUS** (Laurentius) *Vaticinium anni 1486*. 8 l. sm. 4°. [Rome, Stephan Planneck, 1486.]
Hain 3633*. Proctor 3671. Gothic type.

109. I-I Vaticanum [anni 1488] 3 l. sm. 4°. [Rome, Stephan Planck, 1488.]
Reichling 1689. Gothic type.
110. **BOSSUS** (Matthaeus) De instituendo sapientia animo. 128 l. 4°. Bologna, Franciscus [Plato] de Benedictis, November 6, 1495. Hain-Copinger 3677*. Pellechet-Polain 2781. Proctor 6609. Census 3677. Roman type. F.
111. I-I Familiares et secundae epistolae. 143 l. fol. Mantua, Vincenzus Bertochus, November 9, 1498.
Hain-Copinger 3671*. Pellechet-Polain 2780. Proctor 6911. Census 3671. Roman type.
112. **BRACK** (Wenceslaus) fla. Vocabularius rerum: f2a. Tabula. Incipit tabula vocabularii f64a. [ad finem:] XXXVI et XXXVI h^c pauca in manifestiorib' puer? sufficient. 64 l. sm. 4. [Speyer, Johann & Conrad Flick, 1485].
Gothic type. Unknown.
113. **BRANT** (Sebastian) 1458-1521. Salutifera [sic] navis. Navis stultorum. [Latin translation by Jacob Locker.] 152 l. sm. 4°. [Lyons], Jacobus Zachonus de Romano (Jacques Sacon), June 28, [1488-1498].
Hain-Copinger 3752. Pellechet-Polain 2825. Proctor 8671. Census 3752. Roman type. Woodcuts. German original (*Das Narrenschiff*, Basel, 1494. Hain 3736).
114. I-I Varia carmina. 128 l. sm. 4. Strassburg, Johannes Reinhard alias Grüninger, August 1, 1498.
Hain 3732*. Collijn: Upsala 376. Proctor 487. Roman type with verses in Gothic. Woodcuts.
Breitenbach (Johann) See Cerasianus.
Brunellus See Wirecker (Nigellus).
115. **BRUNSCHWIG** (Hieronymus) [-1500]. Buch der Vergift der Pestilenz. 40 l. fol. Strassburg, Johann Reinhard alias Grüninger, Mittwoch nach unserer lieben Frauen Hymelfart (August 19), 1500.
Hain 4020*. B. M. C. I, 115. Klebs: Pest 9. Pellechet-Polain 3040. Proctor 495. Sudhoff 205. Census 4020. Gothic type. Woodcuts.
116. **BÜCHLEIN** (Ein) von der Liebe Gottes mit samt dem Spiegel der Kranken und sterben den Menschen. 154 l. 12°. Augsburg, Hans Schonsperger, July 26, 1498.
Hain-Copinger 4064, B. M. C. II, 372. Proctor 1796. Sudhoff 235. Gothic type.
117. **BURLEY** (Walter) [1275?-1357?]. De vita et morborum, philosophorum et poetarum. 89 l. fol. Nuremberg, Anton Koberger, [1472].
Hain 4112*. Collijn: Stockholm 287. Pellechet-Polain 3086. Proctor 1973. Census 4112. Gothic type.
118. I-I Expositio sive scriptum: Super artem veterem Aristotelis. 118 l. fol. Venice, Christophorus Arnold. [circa 1487].
Hain 4127*. Proctor 4218. Voulliéme: Berlin 3708. Gothic type. F.
119. **CABALLUS** (Franciscus). De numero partium ac librorum physicae doctrinae Aristotelis Joanni Aurelio ejus filio. 20 l. fol. [Venice, Matthaeus Capcasa, 1489-90.].
Copinger-Reichling 1398. Pellechet-Polain 3127. Proctor 4991. Roman and Greek type.
120. **CANDIDUS** (Petrus). De genitura hominis. 7 l. sm. 4°. [Rome, Johannes Besicken, 1488.]
Hain 4316*-7. Gothic type.

121. I-I The same. 7 l. 4°. [Rome, Stephan Plannck, *circa* 1490.]
B. M. C. IV, 100. Pellechet-Polain 3195. Proctor 3772. Reichling 104.
Census p. 60. Gothic type.
122. **CANONICUS** (Johannes) Quaestiones in VIII libros physicorum
Aristotelis. 208 l. fol. Padua, [Albrecht von Stendal], April
25, 1475.
Hain 4344*. Proctor 6785. Census 4344. Gothic type.
123. **CANUTUS**, *Episcopus Arusiensis* [Kamintus]. Regimen contra
pestilentiam. 8 l. 4°. [Antwerp, Mathias van der Goes, *circa*
1484.]
Campbell's Annales 1066. Copinger 3431. Klebs: Pest 13. Census p. 132.
Gothic type.
124. I-I The same. 6 l. 4°. [Leipzig], Arnoldus de Colonia, [1493].
Hain 9757. B. M. C. III, 645. Proctor 3004. Census 9757. Gothic type.
125. **CAPELLUTI** (Rolando) [*circa* 1264]. Tractatus de curatione
pestiferorum apostematum. 6 l. 4°. [Rome, Stephan Plannck,
circa 1485.]
Hain 4375*. Pellechet-Polain 3228. Proctor 3773. Census 4735. Gothic type.
Kl. bs: Pest 38.
126. **CARACCIOLI** (Robertus) Sermones per adventum seu collecta
magistralia de formatione hominis moralis, 61 l. fol. Nuremberg,
Fredericus Creusner, 1479.
Hain-Copinger 4458. Pellechet-Polain 3270. Proctor 2148. B. M. C. II, 540.
Voullième: Berlin 1807, 5. Census 4458. Gothic type.
127. **DE CARPANIS** (Dominicus) Epistola de nutrienda memoria ad
Salvatorem de Peregrinis. 7 l. sm. 4°. [Naples, Berthold
Rihing, December 16, 1476.]
Hain-Reichling 4536. Roman type.
128. **CATINELLI** (Hieronymus). Prognosticon anno salutis 1500.
4 l. sm. 4°. [Bologna, Justinian de Ruberia, after December
17, 1499.]
Reichling 1698. Gothic type.
129. **CELSUS** (Aurelius Cornelius) [*circa* 14-37 A.D.] De medicina.
196 l. fol. Florence, Nicolaus Laurentii, 1478.
Hain-Copinger 4835*. Burger p. 464. Proctor 6116. Census 4835. Roman
and Greek type. Editio princeps. F.
130. I-I The same. 152 l. fol. Milan, Leonardus Pachel & Uldericus
Schinzenzeler, 1481.
Hain-Copinger 4836. Burger p. 516. Pellechet-Polain 3465. Proctor 5940.
Census 4836. Roman and Greek type.
131. I-I The same. 62 l. fol. Venice, Johannes Rubeus, July 8, 1493.
Hain-Copinger 4838*. Pellechet-Polain 3466. Proctor 5134. Census 4837.
Roman and Greek type. F.
132. I-I The same. 94 l. fol. Venice, Philippus Pinzius, May 6, 1497.
Hain-Copinger 4838*. Pellechet-Polain 3467. Proctor 5316. Census 4838.
Roman and Greek type. F.
133. **CENSORINUS**. De die natali. [*Also:*] Cebes: Tabula, [etc.] 38
l. fol. Bologna, Benedictus Hectoris Faelli, May 12, 1497.
Hain-Copinger 4847*. Pellechet-Polain 3471. Proctor 6633. Census 4847.
Roman type, with unaccented Greek words. F.
134. **CERASIANUS** (Johannes) [Johannes Breitenbach]. Repetitio
C. sententiam sanguinis. 56 l. sm. 4°. Leipzig, Melchor Lot-
ter, 1499.
Hain-Copinger 3771* (Breitenbach), 4880. Proctor 3033. Gothic type.
135. **CERMISONUS** (Antonius) Consilia medica [*Also:* Consilia Gen-
tilis. Receptae Gentilis de febribus. Tractatulus de balneis

- Gentilis. Tractatulus de tryiaca Francisci Caballi.] 98 1. fol. Venice, [Bonetus Locatellus for Octavianus Scotus, circa 1496.] Hain-Copinger 4884*. Collijn: Stockholm 314. Pellechet-Polain 3499. Proctor 5074. Voulliéme: Berlin 4312. Census 4884. Gothic type. Device of Scotus at end. *F.*
136. **CHAMPIER** (Symphorien) 1472-1539. Janua logice et physico. 60 1. sm. 4°. Lyons, Guillaume Balsarin, October 5, 1498. Copinger, 9360 [*sub voce* Janua]. Collijn: Stockholm 315. Pellechet-Polain 3511. Gothic type. With terminal woodcut. Editio princeps.
137. **I-I Practica nova in medicina.** 149 1. sm. 4°. [Lyons, circa 1500.] Hain-Copinger 4907*. Census 4907. Gothic type. Title-page in black and red. Woodcut. *F.*
138. **CHAPPUSIUS** (Nicolaus) De mente et memoria. fla. Nicolai Chappusii de me/te et memoria libellus. *Ad finem: FINIS.* 18 1. sm. 4°. [Paris, Dionys Roce, 1493.] Roman type. Printer's device on title-page. Unknown. Charlier (Jean). See Gerson (Joannes).
139. **CHERUBINI DA SPOLETO.** Regola della vita spirituale e matrimoniale. 27 1. sm. 4°. [Florence, Franciscus Dini (?), circa 1487.] Hain-Reichling 4930. Roman type.
140. **CHIROMANTIA** ex divina philosophorum academia. 23 1. sm. 4°. Venice, Bernardinus de Benaliis, October, 1493. Hain-Copinger-Reichling 4976. Census 4976. Roman type. Woodcuts.
141. **CICERO** (Marcus Tullius) [106-43 B.C.] Libelli de senectute [et amicitia, de somno Scipionis, et paradoxa.] 40 1. sm. 4°. [Cologne, Heinrich Quentell, May 8, 1490.] Hain 5295*. Proctor 1298. Gothic type.
142. **CLAUDIAN** (Claudius) [4th Century A.D.] Opera [diligenter emendata per Thadaeum Ugoletum Parmensem.] 263 1. sm. 4°. Venice, Christophorus de Pensis, May 23, 1500. Hain-Copinger-Reichling 5373*. Proctor 5252. Census 5573. Roman type.
143. **COLUMNA** (Ægidius) [Romanus de Colonna.] De regimine principum. fol. Rome, Stephan Planneck, May 9, 1482. Hain-108*. Collijn: Stockholm 326. Pellechet 69. Proctor 3631. Census 108. Gothic type. *F.*
144. **I-I** The same. 136 1. fol. Venice, Simone Bevilacqua, July 9, 1498. Hain 109*. (Hain-Copinger 504). Collijn: Stockholm 326. Pellechet 70. Proctor 5407. Voulliéme: Berlin 4409. Census 109. Roman type. See, also, Albertus Magnus.
145. **I-I** Expositio super libros elenchorum Aristotelis. 71 1. fol. Venice, Bonetus Locatellus, February 6, 1496. Hain-Copinger 140*. Collijn: Upsala 5. Pellechet 85. Proctor 5067. Gothic type.
146. **CONCOREGIO** (Johannes). Opus de aegritudinibus particularis, flos florum vocatum. 65 1. fol. Pavia, Antonius de' Carcano, April 6, 1485. Hain-Copinger 5615*. Proctor 7056. Gothic type. *F.*
di Coppo (Giovanni) See Geminiano.
de Corbeil (Gilles) See Aegidius Corboliensis.
Cordo (Simone) See Simon Genuensis.
147. **DE CRESCENTIIS** (Petrus) Libro della agricultura. fol. Vicenza, Leonardus [Achates] de Basilea, February 17, 1490. Hain-Copinger 5838. Proctor 7128. Census 5838. Roman type.
148. **DANIEL.** Interpretationes seu somnia Danielis prophete revelata

ab angelo missus a deo et primo de diebus lune, et cetera. 8 l. sm. 4°. [Rome, Andreas Freitag, n. d.]
Hain 5931*. Helin-Droz 23. Census 5931 bis. Gothic type.

149. I-I The same. sm. 4°. [Rome, Bartholomaeus Guldinbeck, 1470.]
Helin-Droz 4. Gothic type.
Descriptiones morborum. See Tractatus descriptionum morbum [etc.].
Despars (Jacques). See de Partibus (Jacobus).
150. **DINUS DE GARBO.** [-1327]. Expositio super III, IV et parte V fen Avicennae. 176 l. fol. Ferrara, Andreas de Belfortis, October 27, 1489.
Hain 6166*. Pellechet-Polain 4250. Census 6166. Gothic type. F.
151. I-I The same. [Also: Gentilis de Fulgineo: Super tractatum Avicennae de lepra. Dinus de Garbo. Tractatus de ponderibus et mensuris. Compilatio emplastrorum et unguentorum.] 152 l. fol. Venice, Johannes Herzog for Andreas de Torresani, December 4, 1499.
Hain 6168*. B. M. C., V. 429. Pellechet-Polain 4252. Proctor 5203. Census 6168. Gothic type. 2 copies.
152. I-I Compilatio emplastrorum et unguentorum. 16 l. fol. Ferrara, Andreas de Belfortis, October 28, 1489.
Hain 6170*. Burger p. 340. Pellechet-Polain 4253. Census 6170. Gothic type.
153. **DIogenES CYNICUS.** Epistolae [translated by Francisco Accolti Aretino. Also: Bruti et Hippocratis epistolae, translated by Rinuccio Aretino]. 54 l. sm. 4°. Florence, Antonius Franciscus, decimo Kalendas Julias (June 22), 1487.
Hain-Copinger 6194. Pellechet-Polain 4272. Census 6194. Roman type.
154. **DONDI** (Giacomo dei) [1298-1359]. Aggregator. 286 l. fol. [Strassburg, Adolph Rusch [the R-printer], circa 1479.]
Hain-Copinger 6395*. Pellechet-Polain 4435. Proctor 248. Voullième: Berlin 2119. Census 6395. Gothic type.
Dullaert de Janduno See de Gandavo.
155. **DUNS SCOTUS** (Johannes) [-1308]. Quaestiones subtilissime in metaphysicam Aristotelis. Ejusdem de primo rerum principio tractatus. Atque theorematum [epithomata] Mauritii Hibernici. 131 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, duodecimo Kalendas Decembris (November 20), 1497.
Hain-Copinger 6450*. Pellechet-Polain 4471. Proctor 5083. Census 6450. Gothic type.
156. [**ELYSIUS** (Johannes)] Libellus de mirabilibus civitatis Putheolorum et locorum vicinorum: ac de nominibus virtutibusque balnearum ibidem existentium. 44 l. sm. 4°. Naples, Arnoldus de Bruxella, December 31, 1475.
Hain-Reichling 6585. Proctor 6690. Roman type.
See; also Alphonsus Boni Hominus.
Engel. See Angeli.
157. **EPISTOLAE GRAECAE** variorum auctorum. [etc.] Partes I-II. 138 l. 4°. Venice, Aldus Manutius, mense martio et XV Kal. Maii (March-April 17), 1499.
Hain-Copinger 6659*. Collijn: Upsala 529. Pellechet-Polain 4613. Census 6659. Greek and Roman types.
158. **EUSEBIUS PAMPHILUS** [-circa 340]. De evangelica praeparationibus a doctissimo utriusque linguae interprete Giorgio Trapezuntio e graeco in latinum versum. 108 l. fol. Treviso, Michael Manzolinus, pridie idus Januarias (January 14), 1480.

- Hain-Copinger 6702*. Pellechet-Polain 4644. Proctor 6474. Census 6702. Roman type.
159. **EYB** (Albertus de) [-1475]. *Margarita poetica*. 174 l. fol. [Venice, Johannes Rubeus, Kal. Januarii (January 1), 1493.] Hain-Copinger. 6824*. Collijn: Stockholm 406. Proctor 5132. Voulliéme: Berlin 4233. Census 6824. Roman type.
160. **FALCUCCI** (Niccolo) [-circa 1412]. *Sermones medicinales VII*. 4 vols. fol. Venice, Bernardinus Stagninus, April 15, 1490—October 8, 1491. Hain 11768*. Pellechet-Polain 4737. Census 11768. Gothic type. Complete. Farinator (Mattheus) *See* *Lumen Animae*. Fasciculus temporis *See* Rolevinck (Werner). Ferrari da Gradi (Gian Matteo) *See* de Gradibus.
161. **FICINO** (Marsilio) [-1499.] *De vita sana*. 91 l. fol. Florence, Antonius Mischominus, tertio nonas Decembris (December 3, 1489). Hain-Copinger 7065*. Pellechet-Polain 4799. Proctor 6151. Census 7065. Gothic type. *F*.
162. I-I *De solo et lumine*. 37 l. sm. 4°. Florence, Antonius Mischominus, pridie Kal. Februarias (January 31), 1493. Hain-Copinger 7079*. Pellechet-Polain 4794. Proctor 6166. Voulliéme: Berlin 2897, 5. Census 7079. Roman type.
163. I-I *De triplici vitta*. 99 l. 4°. [Venice, Bartholomaeus de Capo d'Istria]. 1498. Hain 7066*. Collijn: Stockholm 417. Günther: Leipzig 3112. Proctor 5639. Census 7066. 2 copies. Roman type.
164. **FIERA** (Baptista) [15th Century]. *Cœna seu de ciborum virtutibus*. 25 l. 4°. [Rome, Eucharius Silber, circa 1484.] Hain-Reichling 7084. Census 7084. Gothic type.
165. **FIRMICUS** (Julius [circa 354 A.D.]) *De nativitatibus*. 119 l. fol. Venice, Simon Bevilacqua, June 13, 1497. Hain 7121*. B. M. C. V. 522. Pellechet-Polain 4814. Proctor 5402. Census 7121. Roman type. Printer's device at end. 2 copies. *F*. Foresti (Giacopo Filippo). *See* Jacobus Philippus Bergomensis.
166. **GADDESSEN** (John of) [1280?-1361]. *Rosa anglica practica medicinae*. 178 l. fol. Pavia, Leonardus Gerla, January 24, 1492. Hain-Copinger 1108*. Pellechet 764. Proctor 7106. Census 1108. Gothic type. *F*.
167. **GALEN** [131-201 A. D.] *Opera*. [Latin translation.] 2 vols. fol. Venice, Philippus Pinzius, August 27, 1490. Hain 7427*. Günther; Leipzig 3535. Pellechet-Polain 4975. Census 7427. Gothic type.
168. I-I *De effectorum locorum notitia*. 39 l. fol. [Venice, Johannes Hamman (Hertzog), 1500.] Hain-7428*. Burger p. 430. Census 7428. Roman type.
169. de **GANDAVO** [Janduno] (Johannes [Dullaert]) *Quaestiones super tres libros Aristotelis de anima*. 158 l. fol. Venice, Joannes de Colonia & Joannes Manthen, July 14, 1480. Hain-Copinger 7460*. Proctor 4344. Census 7460. Gothic type.
170. I-I The same. 189. fol. Venice, Joannes Lucilius Santritter & Hieronymus de Sanctis, 12. calend. decemb. 1488. Hain-Reichling 7457. Gothic type.
171. **GART DER GESUNDHEIT** (Hortus sanitatis germanice) 321 l. fol. Mainz, Peter Schoeffer, March 28, 1485. Hain 8948*. Klebs: Herbals 1. Proctor 123. Voulliéme: Berlin 1542. Census 8948. Gothic type. Colored woodcuts. Imperfect. *See, also*, Hortus sanitatis.

172. **GAZIO** (Antonio) [-1550]. [Corona florida medicinae.] [De conservatione sanitatis.] 124 l. fol. Venice, Joannes & Gregorius de Gregoriis, June 20, 1491.
Hain-Copinger 7501*. Pellechet-Polain 5003. Proctor 4518. Census 7501. Roman type. F.
173. **GEMINIANO** (Johannes [Gorus] de Sancto) [Giovanni de Coppo *alias* Helwicus Teutonicus]. Summa de exemplis ac similitudinibus rerum. 392 l. sm. 4°. [Venice, Johannes & Gregorius de Gregoriis, April 10, 1497.]
Hain-Copinger 7545*. Proctor 4556. Census 7545. Gothic type.
174. I-I The same. 386 l. 4°. Venice, Joannes & Gregorius de Gregoriis, July 12, 1499.
Hain-Copinger 7547*. Proctor 4560. Census 7547. Gothic type.
175. I-I The same. 342 l. sm. 4°. Basel, Johannes Froben & Petrus de Langendorff, in die conversionis sancti Pauli (January 25), 1499.
Hain 7546*. Proctor 7764. Census 7546. Gothic type.
176. **GENTILE DA FOLIGNO**. [-1348]. Super prima fen quarti canonis Avicennæ de febre et de majoritate morbi. [Scriptum completum anno 1346]. 172 l. fol. Padua, Nicolaus Petri de Harlem, February 19, 1476.
Hain-Reichling 7565. Burger p. 533. Pellechet-Polain 5025. Census 7565. Roman type.
177. I-I The same. [Anno Domini 1399 edita.] 182 l. fol. [Bologna, Balthasar Azoguidus, 1477.]
Hain-Copinger 7566*. Pellechet-Polain 5026. Proctor 6522. Roman type.
178. I-I De majoritate morbi [Anno Domini 1344 edita.] 15 l. fol. [Padua, Nicolaus Petri de Harlem, 1476.]
[cf Hain 7573*]. Roman type.
179. I-I Consilium contra pestilentiam. 20 l. 4°. [Colle, Bonus Gallus, 1478-9.]
Pellechet-Polain 5021. Reichling 530. Census p. 102. Gothic type.
Klebs: Pest 51.
180. I-I Tractatus de febribus. 45 l. fol. Padua, Matthæus Cerdonis, December 2, 1486.
Copinger 11, 2653. Gothic type.
181. I-I Tractatus de proportionibus medicinarum. 10 l. sm. 4°. [Padua, Matthæus Cerdonis, n. d.]
Hain-Copinger 7569*. Proctor 6828. Census 7569. Gothic type. 2 copies.
See, also Ægidius Corboliensis. F.
182. **GERARDUS DE HARDERWIJK**. [-1503]. Epitomata sive reparationes totius philosophiae naturalis. 340?-296 l. 4°. [Cologne, Henricus Quentell, pridie calendes martii (February 29), 1496.]
Hain 8362*. B. M. C. I., 285. Pellechet 327; 5064. Proctor 1333. Census 8362. Gothic type. Woodcut of Albertus Magnus on title-page.
183. **GERSON** (Joannes de) [Jean Charlier (1363-1429)]. De pollutione nocturna et diurna. De cognitione castitatis. Forma absolutionis sacramentalis. 32 l. sm. 4°. [Cologne, Ulrich Zell, circa 1467.]
Hain 7690*-7697. [Hain-Copinger 7704.] Pellechet-Polain 5212; 5135. Proctor 806; 807. Census 7690-7697. Klebs [identification.]. Gothic type.
184. I-I De pollutione nocturna. 13 l. sm. 4°. [Cologne, Johannes Guldenschaff, circa 1480.]
Copinger 2691. Holtrop II, 255. Voulliéme: Köln, 481. Gothic type.

185. I-I De pollutione nocturna et diurna. De cognitione castitatis. 12 l. sm. 4°. [Cologne, Ludwig von Renchen, *circa* 1495.] Hain 7701*. Burger p. 559. Proctor 1275. Klebs [identification]. Census 7701. Gothic type. Imperfect.
186. I-I The same. ff. 15a-28a. sm. 4°. [Cologne, Ludwig von Renchen, *circa* 1495]. Imperfect. Gilles de Corbeil *See* Ægidius Corboliensis.
187. GORDON (Bernardus de) [*circa* 1285-1307]. *Practica dicta Lilium medicinæ*. 186 l. fol. Ferrara, Andreas Beaufort, May 18, 1486. Hain-Copinger 7796*. Pellechet-Polain 5274. Proctor 5749. Census 7796. Gothic type.
188. I-I The same. 206 l. fol. Lyons, Antonius Lambillon & Marinus Sarasin, May 2, 1491. Hain-Copinger 7797*. Pellechet-Polain 5275. Census 7797. Gothic type.
189. I-I The same. 271 l. 4°. Venice, Joannes & Gregorius de Gregoriis, January 16, 1496. Hain 7799*. Pellechet-Polain 5276. Proctor 4551. Census 7799. Gothic type.
190. I-I The same. 96 l. fol. Venice, Bonetus Locatellis for Octavianus Scotus, December 22, 1498. Hain 7800*. Pellechet-Polain 5277. Proctor 5095. Voullième: Berlin 4200. Census 7800. Gothic type. Gorus (Johannes). *See* Geminiano.
191. DE GRADIBUS (Johannes Matthæus) [Gian Matteo Ferrari da Gradi (-1472)]. *Practica* [sive *Commentarium textuale in nonum Almansoris*: October 17, 1462-September 24, 1471]. Pars. I-II. 2 vols. fol. [Milan [Pavia], Philippus de Lavagna & Johannes de Sidriano, [begun before October 29, 1472; completed not later than October 30, 1472]]. Hain-Reichling 7836. Pellechet-Polain 5284. Census 7836. Gothic type. Vol. I. presented by Dr. Arnold C. Klebs. Only other complete copy in Pierpont Morgan Library (New York).
192. I-I Super XXII fen tertii canonis Avicennæ. 104 l. fol. Milan, Jacobus de San Nazario, November 17, 1494. Hain 7840*. Burger p. 575. Pellechet-Polain 5286. Census 7840. Gothic type. F. Granchi (Bartolommeo). *See* Bartholomæus de Sancto Concordio.
193. GRAPALDI (Francesco Maria) *De partibus aedium . . . apotheca, hortus, piscina, [etc.]* sm. 4°. [Parma, Angelus Uguletus, *circa* 1494]. [Hain-Copinger-Reichling 7868. Proctor 6870.] Roman type.
194. GRASSI (Benvenuto) *De oculis*. 34 l. sm. 4°. [Ferrara, Severinus de Ferrara, 1474.] Hain-Reichling 7869. Burger p. 398. Pellechet-Polain 5300. Census 7869. Roman type. Reprinted by Giuseppe Albertotti (Pavia, 1897). Provençal version, edited by Henri Teulié (Paris, 1900), English translation by Casey A. Wood (Stanford University, [California], Press, 1930). F.
195. GRATIA DEI (Johannes Baptista), Esculanus [-1341]. *Quæstiones* [in libros physicorum Aristotelis] in studio Patavino disputatae. 43 l. fol. Venice, April 30, 1484. Hain-Reichling 7877. Collijn: Upsala 612. Census 7877. Gothic type.
196. GRÜNPECK (Joseph von Burckhausen). *De pestilentiali scorra sive mala de Franczos origine*. 12 l. sm. 4°. [Cologne, Cornelis de Zienkzee, 1496 *vel subseq.*] Hain 8092*. Burger p. 655. Proctor 1501. Census 8092. Gothic type. Title-page and text in woodcut.

197. **GUAINERI** (Antonius) [-circa 1440]. Tractatus de propriis mulierum ægritudinibus [seu de matricibus]. 41 l. sm. fol. [Padua, Conrad de Paderborn], 1474.
Hain-Copinger-Reichling 8104. Census 8104. Gothic type.
198. I-I Tractatus de febribus. 49 l. fol. [Padua, Conrad de Paderborn, 1474.]
Burger p. 517. Copinger-Reichling 2803. Census 8104 bis.
199. I-I Opera medica. [f.la. Incipit tractatus de egritudinibus capitis.] [Also: De febribus. De balneis (MS.).] 316 l.-287 l. fol. Pavia, Antonius Carcanus, 1481.
Hain-Reichling 8097. Census 8097. Gothic type.
200. I-I The same. [Also: Arnoldus de Villanova: Practica.] 257 l. fol. Pavia, Antonius Carcanus, January 10, 1488.
Hain-Copinger 8098*. Proctor 7057. Census 8098. Gothic type.
201. **GUIELMUS ARVERNUS**. Bishop of Paris [circa 1437]. De fide et legibus. 139 l. fol. [Augsburg, Günther Zainer, circa 1469.]
Hain 8317*. Proctor 1556. Census 8317. Gothic type.
202. **GUY DE CHAULIAC**. [1300-70]. [Inventario overo collectorio che apartien a la parte de la cirogia composito e compido del anno 1363 . . . El correctore: Paulo Varisco.] 239 l. fol. Venice, Nicolo Girardenho, November 2, 1480.
Burger p. 417. Copinger-Reichling 1548. Census 4813 bis. Roman type. 2 copies. F.
203. I-I The same. [Italian translation.] 116 l. fol. Venice, Petrus de Quarengiis, August 21, 1493.
Hain 4817. B. M. C. V, 511. Proctor 5476. Census 4817. Gothic type.
204. I-I The same. [Latin text]. 136 l. sm. 4°. [Lyons, Vincentius de Portonariis, 1499.]
Copinger 1546. Burger p. 544. Gothic type.
205. I-I The same. 267 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, undecimo Kal. Decembres (November 21), 1498.
Hain-Copinger 4811. Pellechet-Polain 3530. Proctor 5093. Census 4811. Gothic type.
206. I-I The same. 271 l. fol. Venice, Simon de Luere for Andreas Torresanus, December 23, 1499.
Hain-Copinger 4812*. Pellechet-Polain 3531. Proctor 5626. Census 4812. Gothic type.
207. **HAEDUS** (Petrus) De amoribus generibus [sive Anterotica]. 104 l. sm. 4°. Treviso, Gerardus Lisa de Flandria, October 13, 1492.
Hain-Copinger 8343*. Collijn: Upsala 681. Proctor 6507. Census 8343. Roman type.
208. **HALY ABBAS** [Ali ben el-Abbas]. [10th Century.] Liber regalis. 187 l. fol. Venice, Bernardinus Riccius, September 25, 1492.
Hain-Copinger 8350*. Burger p. 563. Proctor 4964. Census 8350. Gothic type.
209. **HALY ALBOHAZEN** [Ali Abu al Hassan]. [11th Century.] Liber de judiciis stellarum [sive de fatiis astrorum.] 152 l. fol. Venice, Erhard Ratdolt, quarto nonas Julii (), 1485.
Hain-Copinger 8349*. Collijn: Stockholm 509; Upsala 682. Proctor 4403. Voullième: Berlin 3800. Census 8349. Gothic type.

210. **HEBERLING VON GMÜNDE** (Joannes) [circa 1490]. *Lectio declarativa super epidemie morbo*. 10 l. sm. 4°. [Lyons, Martin Havard, 1493?]
Hain-Reichling 8413. Burger 500. Klebs: Pest 54. Gothic type.
211. **HENRICUS DE HASSIA** [Heinrich Langenstein (-1397)]. *Secreta sacerdotum* [per Michaellem Lochmayer correct]. 12 l. sm. 4°. Leipzig Melchior Lotter, sexto Novembris Kalendas (October 27)), 1499
Hain-Copinger 8387*. B. M. C., III, 651. Proctor 3037. Census 5357. Gothic type.
212. **HENTISBERUS** (Guilelmus) *Regulae, videlicet de sensu composito et diviso . . . Item Sophismata*. 68 l. fol. Venice, Joannes de Forlivio et Gregorii fratres, March 15, 1491.
Hain-Reichling 8436. Gothic type.
213. **HERBARIUS LATINUS** [Tractatus de virtutibus herbarum Arnoldi de Villa Nova]. 174 l. 4°. [Passau, Johannes Petri, 1485.]
Hain 8445*. Collijn: Upsala 691. Pellechet 1312. Proctor 2829. Klebs: Herbals. Census 8445. Gothic type. 150 woodcuts.
214. I-I The same. 172 l. 4°. Venice, Simon Bevilacqua, December 14, 1499.
Hain-Copinger 1807*. Klebs: Herbals. Pellechet 1315. Proctor 5415. Census 1807. Roman type. 150 woodcuts, 2 copies, one with tinted pictures.
215. **HERMES TRISMEGISTUS**. *De potestate et sapientia Dei per Marsilium Ficinum traductus*. 32 l. sm. 4°. Venice, Damianus de Mediolano, May 10, 1493.
Hain-Copinger 8461*. B. M. C. V, 543. Collijn: Upsala 693. Proctor 5514. Census 8461. Roman type. F.
216. I-I *Pimander de sapientia et potestate Dei. Asclepius de voluntate Dei. Crater Hermetis a Lazarello Septempedano*. 42 l. 4°. [Venice, Johannes Hermann alias Liechtenstein, circa 1500.]
Hain 8455. Proctor (XVI Century) 5674. Census 8455. Gothic type.
Hermolaus Barbarus. See Barbarus.
217. **HIERONYMUS VICECOMES**. *Lamiarum sive striarum opusculum*. 24 l. sm. 4°. Milan, Leonhard Pachel, September 13, 1490.
Copinger 6200. Panzer, II, 62.340. Proctor 5986. Census p. 117. Roman type.
218. **HIPPOCRATES**. *Aphorismi* [Editor: Theodorus Ulsenius. Also: Ulsenius: *De pharmacandi comprobata ratione* (fragmentary).] 24 l. sm. 4°. [Nuremberg, Caspar Hochfeder, 1496.]
Hain 8673-16088. Gothic type. Preceded by MS. prayer in black and red script, a poem "Ad Harpyiam" with arms of Nuremberg (woodcut) above, and two introductory epistles addressed to Udalricus Pyndar (f 1b) and Martin Mellerstat (f 17b). Fragment of poem *De pharmacandi* begins on f 18a.
219. I-I *De natura hominis et alia opuscula*. 20 l. 4°. [Rome, Georg Herolt or Stephan Planneck, n. d.]
Hain-Copinger 8669*. Burger p. 434. Proctor 3943. Census 8669. Roman type.
Honain ben Isaac. See Joannitius.
220. **HORTULUS ANIMAE**. 236 l. sm. 4°. Strassburg, Wilhelm Schaffener, March 13, 1498.
Hain 8936. Schreiber 4242. Census 8936. Gothic type. Woodcuts. Incomplete MS. of 32 l., with colored initials (Prayer-book) at end.
221. **HORTUS SANITATIS** [Middle Rhine]. *Ortus sanitatis*. 454 l. fol. Mainz, Jacob Meydenbach, June 23, 1491.

- Hain-Copinger 8944*. B. M. C. I, 44. Klebs: Herbals 1. Censu 8944. Gothic type. 1073 woodcut illustrations (7 full page). F.
222. I-I The same. [Upper Rhine]. 360 l. fol. [Strassburg, Johann Prüss, circa 1497.]
Hain-Copinger 8942*. Klebs: Herbals 3. Proctor 1447. Censu 8942. Gothic type. 3 full-page woodcuts.
Hortus sanitatis germanice. See Gart der Gesundheit.
223. HUGO SENENSIS [Ugo Benzi (circa 1370-1439)]. Tractato utilissimo circa la conservatione de sanitate. 52 l. sm. 4°. Milan, Petrus de Corneno, May 31, 1481.
Hain-Copinger-Reichling 9021. Proctor 5973. Gothic type. F.
224. I-I The same. 102 l. fol. [Bologna], Joannes Walbeck de Noerdlingen Henricus de Harlem. October 23, 1482.
Hain-Copinger 9020*. Proctor 6556. Gothic type.
225. I-I The same. 70 l. Pavia, [Leonardus Gerla], 18. Kal Maías (April 14), [1498].
Reichling 1544. Censu 9018 *ter*. Gothic type. F.
226. I-I Super IV Fen primi canonis Avicennæ. 57 l. fol. Venice, Andreas Calabrensis, February 4, 1485.
Hain-Copinger 9018*. Proctor 4965. Censu 9018. Gothic type.
227. I-I In primam Fen primi canonis Avicennæ expositio. [Also: Antonius Faventinus. De febre]. 160 l. fol. Ferrara, Andreas Belfortis, August 13, 1491.
Hain-Copinger-Reichling 9016. Proctor 5751. Censu 9016. Gothic type.
228. I-I Super aphorismos Hippocratis et super commentum Galeni. 190 l. fol. Ferrara, Lorenzo Rossi & Andreas de Grassis, November 15, 1493.
Hain 9011*. Voulliéme: Berlin 2873. Censu 9011. Gothic type.
229. I-I The same. 160 l. fol. Venice, Bonetus Locatellus, May 23, 1498.
Hain-Copinger 9012*. Proctor 5088. Censu 9012. Gothic type. F.
230. I-I In quarti canonis Avicennæ fen primam expositio. 60 l. fol. Pavia, Andreas de Bosco, October 29, 1498.
Reichling 1766. Censu 9018 *bis*. Gothic type.
231. I-I Super I et II fen primi canonis Avicennæ. 125 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, Kalendas Maías (April 27), 1498.
Hain-Copinger 9017*. Voulliéme: Berlin 4204. Censu 9017. Gothic type. F.
232. HYGINUS (Caius Julius) [circa 207 A.D.] [Poeticon astronomicum]. De mundi et spheræ ac utriusque partium declaratione. [Scemmus spherecina]. 57 l. sm. 4°. Venice, Erhard Ratdolt, October 14, 1482.
Hain-Copinger 9062*. B. M. C. V, 286. Proctor 4387. Censu 9062. Gothic type. Illustrations.
233. I-I The same. Von den zwoelf Zaichen und XXXVI Bildern des Hymels met yedes Stern. 421 l. sm. 4°. Augsborg, Erhart Ratdolt, after March 8, 1491.
Hain 9067*. Proctor 1890. Schreiber 4257. Gothic type.
234. IAMBlichus [circa 330 A.D.] De mysteriis Ægyptorum. 185 l. fol. Venice, Aldus Manutius, September, 1497.
Hain-Copinger 9358*. Collijn: Stockholm 581; Upsala 786. Proctor 5559. Voulliéme: Berlin 4495. Censu 9358. Roman type.
235. ISIDORUS HISPALENSIS, Episcopus [circa 570-636] Etymologiarum libri xx. 264 l. fol. [Augsburg], Günther Zainer, November 19, 1472.

Hain 9273*. Collijn: Stockholm 554; Upsala 758. Proctor 1532. Census 9273. Roman type. Illuminated initials. Woodcuts.

236. **JACOBI** (Joannes) [Jean Jasme] [-1384.] *Perutilis tractatus de pestilentia*. 12 l. 4°. [Augsburg, Johann Keller, circa 1480.] Hain 12745*. Proctor 1746. Klebs: Pest 62. Census 12745. Gothic type. See, also, Canutus.
237. **JACOBUS FOROLIVIENSIS**. [Giacomo della Torre (14th Century)] *Expositio in Avicennae capitulum de generatione embryonis*. 44 l. fol. [Pavia, Antonius de Carcano, 1479.] Hain-Copinger-Reichling 7234. Osler 183. Proctor 7052. Gothic type.
238. **I-I Expositiones in primum librum Canonis Avicennae**. 149 l. fol. Venice, December 21, 1479. Hain 7242*. Osler 175. Gothic type. Illuminated letters.
239. **I-I In aphorismos Hippocratis expositio cum questionibus**. 135 l. fol. [Pavia, circa 1480.] Hain 7246. Census 7246. Gothic type.
240. **I-I Expositio in Hippocratis aphorismos cum additionibus Marsilii super aphorismos Hippocratis et questiones eorundem**. 154 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, March 10-May 20, 1495. Hain-Copinger 7251. Copinger III, p. 261. Voulliéme: Berlin 4188. Census 7251. Gothic type.
241. **JACOBUS PHILIPPUS BERGOMENSIS** [Giacopo Filippo Foresti, of Bergamo] [-1520] *Supplementum chronicarum*. 270 l. fol. Venice, Bernardus Rezius de Novaria, February 15, 1492. Hain-Copinger 2809*. Pellechet 2068. Proctor 4962. Census 2809. Gothic type.
Janduno, Janjuno. See de Gandavo.
Janus Damascenus. See Mesue.
Jasme (Jean). See Jacobi (Joannes).
242. **JOANNITIUS** [Honain ben Isaac. (809-873)] *Isagogæ in tegni Galeni*. 72 l. 4°. Leipzig, Wolfgang [Stöckel] of München, May 27, 1497. Hain-Copinger 9435. Census 9435. Gothic type.
John XXI, Pope. See Petrus Hispanus.
243. **JOSEPHUS** (Flavius.) [-circa 95 A.D.] *De antiquitatibus ac de bello Judaico*. 260 l. fol. Venice, Albertinus [Rubeus] Verzellensis, October 23, 1499. Hain-Copinger 9455*. Proctor 5148. Census 9455. Roman type.
244. **JUNG** (Ambrosius). *Tractatulus perutilis de pestilentia*. 18 l. 4°. Augsburg, Johannes Schönsperger, feria quinta post Elizabeth (November 20), 1494. Hain 9472*. B. M. C. II, 368. Klebs: Pest 65. Census 9472. Gothic type. F. Kamintus. See Canutus.
von Kaub [Johann (Wonnecke)]. See Gart der Gesundheit.
245. **KETHAM** (Joannes de) [Johann von Kirchheim]. *Fasciculus medicinæ*. 40 l. fol. Venice, Joannes & Gregorius de Gregoriis, October 15, 1495. Hain-Copinger 9775*. Proctor 4550. Census 9775. Gothic type. 10 full-page woodcuts. Facsimile reproduction by Karl Sudhoff (Milan, 1923).
246. **I-I The same**. 32 l. fol. Venice, Joannes & Gregorius de Gregoriis, February 17, 1500. Hain 9777*. Proctor 4561. Census 9777. Gothic type. 9 woodcuts.
247. **LACTANTIUS**, (Lucius Coelius Firmianus) [4th Century] *Opera*

- omnia. 227 l. fol. Venice, Johannes de Colonia & Johannes Manthen, August 27, 1478.
Hain-Copinger, 9814*. B. M. C. V. 233. Collijn: Upsala 933. Proctor 4332. Census 9814. Roman type.
248. **LAMBERTUS DE MONTE.** Copulata circa octo libros physicorum Aristotelis juxta doctrinam sancti Thomas de Aquino. 146 l. 4°. [Cologne, typis Theodorici, circa 1485.]
Voullième: Köln 727. Census 1674. Gothic type. From library of Pierre Duhem.
249. **LANFRANCHI.** [-1315]. Chirurgia menor. 132 l. fol. Seville, por tres Alemanes companeros, May 15, 1495.
Hain-Copinger-Reichling 9881. Haebler 349. Proctor 9523 A. Census 9881. Gothic type.
250. **LAPIDARIUM** omni voluptate refertum et medicinae plurima experimenta complectens. 28 l. sm. 4°. Vienna, Johann von Winterburg, [circa 1495.]
Copinger 3492. Census p. 134. Gothic type.
251. **LEONICENUS** (Nicolaus) [1482-1524.] De Plinii et plurimorum aliorum in medicina erroribus. 18 l. sm. 4°. Ferrara, Lorenzo Rossi & Andreas de Grassis, December 18, 1492.
Hain-Copinger 10021*. Proctor 5760. Voullième: Berlin 2872. Census 10021. Gothic type. F.
252. **I-I** De epidemia quam vulgo morbum gallicum vocant. 27 l. sm. 4°. Venice, Aldus Manutius, June, 1497.
Hain-Copinger 10019*. Proctor 5557. Voullième: Berlin 4493. Census 10019. Roman type. 2 copies. F.
253. **I-I** The same. De epidemia quam vulgo morbum Gallicum vocant sive brossulas. 31 l. sm. 4°. Milan, Guilelmus Signerre, July 4, 1497.
Hain 10020. Reichling V, p. 172. Census 10020. Roman type. F.
254. **LICHTENBERGER** (Johannes) Practica und Prognostication [1488-1567] 45 l. sm. 4°. [Mainz, 1492.]
Hain 10087*. Sudhoff, 434. [Latin text: Reichling 967.]
255. **LILIUS VICENTINUS** (Zacharias) De origine et laudibus scientiarum. 28 l. sm. 4°. Florence, Franciscus Bonaccursius, septimo idus Aprilis (April 20), 1496.
Hain-Copinger 10103. Proctor 6316. Census 10103. Roman type. Device of patron (Pietro Pacini de Pesci) at end.
256. **LOCHER** (Jacobus) De partu monstroso carmen. 40 l. 4°. Ingolstadt, [Johann Kachelofen, XV. Kalendas Decembris (November 26), 1499.] Two woodcuts.
Hain 10162*. Proctor 3165. Census 10162. Gothic type.
257. **LUCRETIUS** (Titus Carus) [98-55 B.C.] De rerum natura. 130 l. sm. 4°. Venice, Theodorus de Ragazonibus, September 4, 1495.
Hain-Copinger 10283*. B. M. C. V. 478. Proctor 5271. Census 10283. Roman type.
258. **LULL** (Raymundus) [1235-1315] Arbor scientiae. 290 l. fol. Barcelona, Petrus Posa, August 22, 1482.
Hain 10318. Haebler 381. Gothic type.
259. **LUMEN ANIMAE** seu liber moralitatum. 372 l. 4°. [Augsburg, Anton Sorg, September 3, 1477.]
Hain 10329*. Collijn: Stockholm 409. Pellechet-Polain 4749. Proctor 1650. Voullième: Berlin 109. Census 10329. Gothic type.
260. **1-I** The same. 348 l. fol. [Augsburg, Günther Zainer, December 31, 1477.]

- Hain 10330*. Collijn: Stockholm 410. Pellechet-Polain 4746. Proctor 1552. Voullième: Berlin 21. Census 10330. Gothic type.
261. I-I The same. 268 1. fol. [Reutlingen, Michael Gryff] July 7, 1479. Hain-Copinger 10331*. Proctor 2689. Census 10331. Gothic type.
262. I-I The same. fol. [Strassburg, Printer of *Legenda aurea*, March 22, 1482.]
Hain-Copinger 10333*. Collijn: Stockholm 411; Upsala 545. Pellechet-Polain 4749. Proctor 413. Voullième: Berlin 2249. Census 10333. Gothic type.
263. MACER FLORIDUS. De virtutibus herbarum. fla. Macer floridus De/viribus herbar f51b. Macer adest disce quo duce doctus eris. 51 1. sm. 4°. [Paris, circa 1490.]
Hain-Copinger 10418. Proctor 8489.
264. MAGNI (Jacobus) [Jacques le Grand] [-1422] Sophologium. 121 1. sm. 4°. Paris, for Jehan Petit. [1495.]
Reichling 240. Gothic type. Device of Petit on title page.
265. MAGNINUS MEDIOLANENSIS [14th Century]. Regimen sanitatis. 175 1. sm. 4°. Louvain, Johannes de Westphalia, 1482.
Hain-Copinger 10483. Proctor 9230. Census 10483. Gothic type.
266. I-I The same. 115 1. 4°. Paris, Udalricus Gering, March 5, 1483.
Hain 10484*. Proctor 7869. Census 10484. Roman type.
267. I-I The same. 93 1. sm. 4°. Basel, Nicolaus Kesler, [circa November 8, 1493.]
Hain 10486. B. M. C., III, 771. Copinger-Reichling 3756. Proctor 7701 A. Census 10486. Gothic type. 2 copies: Variant I, i-b is blank. Variant II contains an epistle [Klebs].
268. I-I The same. [Also: Reginaldus de Villanova. De phlebotomia. Hippocrates: De astronomis: secreta. Averroës. De venenis. Nicolaus Salernitanus: Quidproquo [etc.] 128 1. 4°. [Lyons, circa 1485?]
Hain 10482*. Burger p. 486. Proctor 8705. Census 10482. Gothic type. F.
269. MAHOMET. Epistolae magni Turci interprete Landivio. 46 1. sm. 4°. [Venice, Bernardino de Vitalibus or Otinus de Luna (Proctor), circa 1498.]
Hain-Copinger-Reichling 10500. Proctor 5615. Census 10500. Roman type.
270. MAIMONIDES (Moses) [1135-1204]. De regimine sanitatis. 40 1. 4°. Florence, Sanctus Jacobus de Ripoli, [circa 1478].
Hain-Copinger 10525*. Burger p. 403. Proctor 6109. Census 10525. Roman type.
271. I-I Aphorismi medici. [Also: Aphorismi Johanni Damasceni et Rasis cum capsula eburnea Hippocratis] 154 1. 4°. Bologna, Franciscus [Plato] de Benedictis for Benedictus Hectoris Faelli, quarto calendas Junii (May 29), 1489.
Hain-Copinger 10524*. Proctor 6588. Voullième: Berlin 2750. Census 10524. Roman type.
272. MAIOLUS (Laurentius) De gradibus medicinarum. 55 1. sm. 4°. Venice [Aldus Manutius, 1497.]
Hain-Copinger 10528. B. M. C. V, 551. Proctor 5562. Census 10528. Roman type. Diagrams.
273. MALDURA (Petrus Ludovicus) [-circa 1490] In vitam sancte Rochi contra pestem epidemie officio. 12 1. sm. 4°. [Mainz, Petrus von Friedberg, 1494.]
Hain-Copinger 10546*. Günther: Leipzig 1836. Klebs: Pest 70A. Census 10546. Gothic type. Title page woodcut of St. Roch with bubo. F.
274. MANFREDI (Girolamo) [-1493] Liber de homine et de conservatione sanitatis [Italian text] 100 1. fol. Bologna, Ugo Rugerius & Donnus Bertochus, July 1, 1474.
Hain-Reichling 10689. Copinger 2623. Proctor 6529. Census 10689. Roman type. F.

275. I-I Tractatus de peste. 36 l. 4°. Bologna, [Johannes Valbeck], December 31, 1479.
Hain-Reichling 10696*. Klebs: Pest 72. Census 10696. Gothic type.
276. **MANILIUS** (Marcus) Astronomicon. 28 l. fol. [Venice, Bernardino de Vitalibus, *circa* 1498.]
Hain-Copinger 10702. Proctor 5692. Census 10702. Roman type. F.
277. **MANLIIS** (Joannes Jacobus de) [15th Century] Luminare majus. 94 l. fol. Pavia, Antonius Carcanus, April 3, 1494.
Hain-Reichling 10711. Proctor 7065. Census 10711. Gothic type. F.
278. I-I The same. 79 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, May 28, 1496
Hain-Copinger 10712*. Collijn: Stockholm 689; Upsala 831. Proctor 5070. Voulliéme: Berlin 4192. Census 10712. Gothic type.
Marsilio Ficino. *See* Ficino.
279. **MARSILIUS AB INGHEN** [-1396] Abbreviationes libri physicorum. 79 l. fol. [Venice, Otinus de Luna (?) *circa* 1490.]
Hain-Reichling 10780. Gothic type.
280. **MATHEOLUS** [de Mattheolis] **PERUSINUS**. Tractatus de memoria augenda. 4 l. sm. 4°. Milan, [-*circa* 1475].
Reichling 623. Osler 88. Gothic type.
281. I-I The same. 4 l. sm. 4°. [Rome, Stephan Planneck, *circa* 1490.]
Reichling 1570. B. M. C. IV, 100. Census p. 150. Gothic type. F.
282. I-I The same. 4 l. sm. 4°. [Rome, Johann Besicken & Sigismund Mayr, n. d.]
Hain-Copinger 10906*. Census 10906. Gothic type.
283. **MAURITIUS HIBERNICUS**. In questiones dialecticas Joannis Scoti expositio. fol. Venice, Simon de Luere, 1499.
Hain 10921. Gothic type.
284. **MENSA PHILOSOPHICA**. [In hos opusculo tractatur de his quibus utemur in mensa]. 49 l. 4°. Cologne, apud praedicatores (Cornelis de Zyrickzee) [*circa* 1500].
Hain-Copinger 11077*. B. M. C. V., 306. Proctor 1504. Voulliéme: Köln 797. Census 11077. Gothic type.
285. I-I The same. [Editor: Theobaldus Angulibertus] 72 l. 12°. Paris, [for Jean Petit] April 14, 1500.
Hain-Copinger 11081. Gothic type [not before 1511 (Proctor)].
286. **MESUE** [Joannes Damascenus (-1015)] De medicinis universalibus et particularibus. 43 l. fol. Venice, Clemens Patavinus Sacerdos, xv Kalendas Junii (May 18), 1471.
Hain-Copinger 11118. Proctor 4142. Census 11118. Roman type.
287. I-I The same. Liber de consolatione medicinarum simplicium. 100 l. fol. Venice, Petrus de Quarengis, December 12, 1493.
Hain-Copinger-Reichling 11116. Gothic type.
288. I-I The same. Mesue vulgare [Libro della consolatione delle medicine semplici solutive] 228 l. fol. Florence, [Bartholomæus de Libris, *circa* 1490].
Hain-Copinger-Reichling 11113. Proctor 6283. Roman type. 2 copies.
289. I-I Opera cum additionibus. 391 l. fol. Venice, Renaldus of Nijmegen, January 31, 1479.
Hain-Copinger 11108*. Proctor 4432. Census 11108. Gothic type.
290. I-I The same. 293 l. fol. Venice, for Dionysius de Bertochis, xii kal. januaris, 1484
Hain 11109. Census 11109*. Gothic type.

291. I-I The same. 398 1. fol. Venice, Peregrinus de Pasquale, December 2, 1489, November 21, 1490, July 18, 1491.
Hain 11110*. Censur 11110. Gothic type.
292. I-I The same. 332 1. fol. Venice, Bonetus Locatellus for Octavianus Scotus, pridie Kalendas Aprilis. (March 31), 1495.
Hain 11111*. Proctor 5059. Censur 11111. Gothic type.
293. I-I The same. Mesue cum expositione Mondini super canones universales [etc.] 360 1. fol. Venice, Johannes & Gregorius de Gregoriis October 14, 1497.
Hain-Copinger 11112*, B. M. C. V., 350. Proctor 4557. Gothic type.
294. METLINGER (Bartholomæus) [-circa 1491-2]. Regiment der jungen Kinder. 27 1. fol. [Augsburg, Günther Zainer, circa December 7, 1473.]
Hain-Copinger 11127. Proctor 1537. Sudhoff 35. Censur 11127. Gothic type.
German version by Ludwig Unger (Leipzig & Wien, 1904). Englished by John Ruhräh in his Pediatrics of the Past, New York, 1925, 75-98). F.
295. I-I The same. 125 1. fol. Augsburg, Johann Bämmler, August 28, 1474.
Hain 11128*. Proctor 1607. Sudhoff 36. Censur 11128. Gothic type.
296. I-I The same. 34 1. 4°. Augsburg, Hans Schaurin, February 13, 1500.
Sudhoff 39. Censur 11128 bis. Gothic type. 4 woodcuts.
Michael Scotus. See Scotus.
297. MONDINO DEI LUZZI [Mundinus (circa 1275-90)]. Anathomia. 34 1. sm. 4°. Padua, Matthæus Cerdonis, 1484.
Hain 11636*. Proctor 6818. Gothic type.
298. I-I The same. 24 1. sm. 4°. Venice, Bernardinus de Vitalibus, February 20, 1494.
Hain-Reichling 11638. Censur 11638. Gothic type.
299. I-I The same. Anathomia, emendata per doctorem Melerstat. 40 1. sm. 4°. [Leipzig, Martin Landsberg, circa 1493.]
Hain-Copinger 11633*. Proctor 2994. Voullième: Berlin 1342. Censur 11633. Gothic type. Woodcut on title-page.
300. MONTAGNANA (Bartholomæus) [-1460] De urinarum iudiciis. 28 1. sm. 4°. Padua, Matthæus Cerdonis, February 17, 1487.
Hain-Copinger-Reichling 11553. Proctor 6821. Censur 11553. Gothic type. F.
301. I-I Consilia medica cum additionibus. 388 1. fol. Venice, Bonetus Locatellus for Octavianus Scotus, quarto nonas Augusti (August 2), 1497.
Hain-Copinger 11552*. B. M. C. V., 448. Proctor 5081. Voullième Berlin 4198. Censur 11552. Gothic type, 2 copies.
302. I-I The same. fol. Venice, Simon de Luere, August 20, 1499.
Copinger 4342. B. M. C. V., 514. Collijn: Upsala; 1068. Proctor 5622. Censur 11552 bis.
de Monte. See Lambertus.
Mundinus. See Mondino.
Müller (Johann). See Regiomontanus.
303. NICANDER [2nd Century A.D.] Theriaca et alexipharmaca 38 1. fol. Venice, Aldus Manutius, July, 1499.
Hain-Copinger 6257*. Proctor 5571. Voullième: Berlin 4506 Censur 6257. Greek type. Library has also Aldine of 1523 and Plantin of 1567 (French translation by Jacques Grevin).
Nicephori s. See Valla.

304. **NICOLAUS SALERNITANUS** [12th Century]. *Antidotarium*. 70 l. 4°. [Venice, Nicolaus Jenson, 1471.]
Hain-Reichling 11764. Proctor 4076. Cens. 11764. Roman type.
305. I-I The same. *Antidotarium cum Mesue*. 95 l. Folio. [Strassburg, Johann Prüss, circa 1480.]
Hain 11763*. Voulliéme: Berlin 2387. Cens. 11763. Gothic type.
Two French translations, edited by Paul Dorveaux (8°. Paris, H. Wetter, 1896).
306. **NIDER** (Johannes.) *Tractatus de morali lepra*. 89 l. numbered lxxvi-cliv sm. 4°. [Louvain], John of Westphalia (John of Paderborn) [circa 1485].
Copinger 4419. Campbell 1288. Cens. 11817 bis. Gothic type. From Library of Robert Proctor.
307. **NOGAROLUS**, (Leonardus) *Liber de mundi aeternitate*. 78 l. fol. Vicenza, Henricus Zeni, pridie kalendas februarias, (January 31), 1486.
Hain-Copinger 11894*. Proctor 7166. Voulliéme: Berlin 4596. Cens. 11894. Gothic type.
Nursia (Benedictus de). See Benedictus de Nursia.
308. **ORTOLFF VON BAYERLAND**. *Arzneibuch*. 86 l. fol. Nuremberg, Anton Koburger, am Montag nach Mitter vasten (March 17), 1477.]
Hain 12112*. Proctor 1977. Sudhoff 22. Voulliéme: Berlin 1646. Cens. 12112. Gothic type. F.
309. I-I The same. 104 l. fol. Augsburg, Anton Sorg, August 11, 1479.
Hain 12113*. Sudhoff 24. Cens. 12113. Gothic type.
I-I [Frauenbüchlein. 8 l. 4°. [Ulm, Günther Zainer, circa 1495.]
Sudhoff 30. Gothic type. Facsimile reprint by Gustav Klein, München, F. Bruckmann, 1909.
Palagari (Pietro). See Tranensis.
310. **DE PARTIBUS** (Jacobus) [Jacques Despars [-1465]. *Summula super remediis ex Mesue libris*. 19 l. 24°. Lyons, [Joannes Trechsel, circa 1500].
Copinger-Reichling 6609. Cens. p. 82. Gothic type. Woodcuts of skeleton and blood-letting mannikin, with legends on ff. 1a and 16b. Also, large paper copy.
311. **PECKHAM** (John) *Prospective communis*. 30 l. fol. [Milan, Petrus de Corneno, circa 1482.]
Hain 9425*. Proctor 5974. Gothic type. Woodcuts of schematic eye on ff. 8b, 9a and 15a. F.
Perusinus. See Matheolus Perusinus.
312. **PETRARCA** (Francesco) [1304-74]. *Epistolae familiares*. 124 l. 4°. Venice, Joannes & Gregorius de Gregoriis, idibus septembris (September 13), 1492.
Hain-Copinger 12811*. Proctor 4526. Cens. 12811. Roman type. F.
313. I-I *De remediis utriusque fortuna*. fol. Cremona, Bernardinus de Misentis & Caesar Parmensis, November 17, 1492.
Hain-Copinger 12793*. Collijn: Stockholm 818. Proctor 6927. Cens. 12793 Roman type. F.
314. **PETRUS DE ABANO**. [circa 1250-1315] *Tractatus de venenis*. 30 l. 4°. Padua, [Leonardus (Achates) of Basel], 1473.
Hain-Copinger 8. Pellechet 7. Proctor 6775. Cens. 8. Roman type. English translation by H. M. Brown in: *Ann. Med. Hist.*, N. Y., 1924, VI, 25-53.
315. I-I The same. 25 l. sm. 4°. Mantua [Thomas de Septemcastris & Johannes Burster] 1473.
Hain-Copinger 7. Proctor 6884. Cens. 7. Roman type.

316. I-I The same. 52 l. 4°. Rome, Joannes Philippus de Lignamine, January 27, 1475.
Hain 9. Pellechet 8. Censur 9. Roman type. F.
317. I-I The same [*Also*: Arnoldus de Villanova. De arte cognoscendi venena. Valescus de Taranta. De epidemia et peste.] 36 l. 4°. [Padua], Matthaeus Cerdonis, December 18, 1487.
Hain 12*. Pellechet 10. Proctor 6826. Censur 12. Gothic type. F.
318. I-I The same. [Emendator: Wilhelm Haldenhoff.] 18 l. 4°. Leipzig, Jacob Thanner, November 9, 1500.
Hain 15*. Burger p. 608. Censur 15. Gothic type.
319. I-I Conciliator differentiarum philosophorum et praecipue medicorum. Tractatus de venenis. [*Also*: Petrus de Carariis de Monte Silice: De terminatione venenorum.] 270 l. fol. Venice, Gabriele Petri for D. Thomas de Tarvisio [Corrector], 1476.
Hain-Copinger 2*. Pellechet 2. Proctor 4196. Censur 2. Gothic type. Imperfect.
320. I-I The same. 284 l. fol. Venice, Johannes Herbart, nonis februarii (February 9), 1493.
Hain-Copinger 6*. Pellechet 5. Proctor 4689. Censur 6. Gothic type.
321. I-I The same. 265 l. fol. Venice, Bonetus Locatellus for Octavianus Scotus, (March 15), 1496.
Hain-Copinger 4*. Pellechet 4. Proctor 5069. Censur 4. Gothic type. Woodcuts. Imperfect.
322. I-I Expositio problematum Aristotelis. 293 l. fol. Mantua, Paul Johannes de Butzbach, 1475.
Hain-Copinger 16*. Osler 95. Pellechet 11. Proctor 6892. Censur 16. Gothic type.
323. I-I The same. 310 l. fol. [Venice], Johann Herbart, February 25, 1482.
Hain-Copinger 17*. Burger p. 43. Pellechet 12. Proctor 4686. Censur 17. Gothic type.
324. PETRUS HISPANUS [Pope John XXI (-1277)] Tesoro de poveri. 82 l. sm. 4°. [Florence, Bartholomaeus de Libris, circa 1480.]
Hain-Reichling 8713. Censur 8713. Roman type. 2 copies.
325. I-I The same. 60 l. sm. 4°. Venice, Giovanni Aluisio de Varesi. November 20, 1490.
Hain-Reichling 15494. B. M. C. V, 170. Roman type.
326. I-I The same Thesaurus pauperum [seu Practica medicinae]. 41 l. sm. fol. Antwerp, Thierry Martens, May 22, 1497.
Hain-Copinger 8712. Proctor 9453. Censur 8712. Gothic type.
327. PEYLIGK (Johannes) [1473-circa 1592] Compendium philosophiae naturalis. 96 l. fol. Leipzig, Melchior Lotter, September 12, 1499.
Hain-Copinger 12861*. Proctor 3036 A. Voulliéme: Berlin 1393. Censur 12861. Gothic type. Woodcuts. F.
328. PFLAUM (Jacob) Das Kalender mit den heiligen Tagen (1477-1552) 260 l. fol. Ulm, Johann Zainer, [1477].
Hain 12869. Schreiber 4937. Gothic type. Diagrams, figures and tables.
329. PHARETRA, auctoritates et dicta doctorum, philosophorum et poetarum continens. 326 l. fol. [Cologne, C. de Homborch, circa 1480].
Hain-Copinger 12907*. Panzer IV, 175,954. Voulliéme: Köln 938. Censur 12907. Gothic type.
330. PHILELPHUS (Franciscus) [Epistolae familiares]. Episto-

larum libri xvi. 90 1. fol. Venice, Barnardinus Corius, April 3, 1489.

Hain-Copinger, 12939. Proctor 5209. Census 12939. Roman and Greek type.

331. **PHILELPHUS** (Johannes Marius) *Epistolae*. 108 1. sm. 4°. Venice, Joannes [Tacuinus] de Monteferrato, October 6, 1492. Hain-Copinger 12976*. B. M. C. V, 527. Proctor 5420. Census 12976. Roman type.

332. **PICO DELLA MIRANDOLA** (Giovanni) [1463-94] *Disputationes adversus astrologos*. 118 1. fol. Bologna, Benedictus Hectoris Faelli, July 16, 1495. Hain-Copinger 12994*. [Part II of Hain 12992.] Census 12994. Roman type.

333. **I-I Omnia opera**. 262 1. fol. Venice, Bernardinus de Vitalibus, August 14, 1498. Hain 12993*. Census 12993. Roman type.

334. **PISTOR** (Simon) *Declaratio defensiva positionis de mala franco*. 9 1. sm. 4°. Leipzig. [Conrad Kachelofen, January 3, 1500]. Hain-Copinger 13021*. B. M. C. III, 629. Proctor 2878. Census 13021. Gothic type.

335. **PLATINA** (Bartholomæus) *De honesta voluptate et valetudine*. 43 1. fol. Venice, Laurentius de Aquila & Sibyllinus UMBER, idibus juniis (June 13), 1475. Hain 13051*. Proctor 4355. Voulliéme: Berlin 3765. Census 13051. Roman type.

336. **I-I The same**. 106 1. sm. 4°. [Rome, Udalricus Gallus (Ulrich Han) *circa* 1475]. Hain-Copinger-Reichling 13049; Proctor 3380. Roman type.

337. **I-I The same**. 96 1. sm. 4°. Bologna, Johannes Antonius de Benedictus, May 11, 1499. Hain-Copinger 13056. Collijn: Upsala 1231. Proctor 6666. Census 13056. Roman type.

338. **PLINIUS** (Caius Secundus) [23-79 A.D.] *Historia naturalis [ex emendatione Philippi Beroaldi]*. 365 1. fol. Parma, Stephanus Corallus, [of Lyon], 1476. Hain-Copinger 13091. Collijn: Stockholm 873. Proctor 6842. Voulliéme: Berlin 3221. Census 13091. Roman type. *F*.

339. **I-I The same**. 266 1. fol. Parma, Andreas Portitia, octavo idus julii, 1481. Hain-Copinger 13094*. Collijn: Stockholm 874. Proctor 6851. Voulliéme: Berlin 3226. Census 13094.

340. **I-I The same**. 355 1. fol. Venice, Rainaldus de Novimagio, June 6, 1483. Hain-Copinger 13095*. B. M. C. V, 257. Proctor 4445. Census 13095. Roman type.

341. **I-I The same**. [E castigationibus Hermolai Barbari quam emendatissime editi]. 57 1. fol. Venice, Joannes Aluisius de Varisio, May 18, 1499. Hain-Copinger 13104. B. M. C. V., 572. Collijn: Upsala 1242. Proctor 5636. Census 13104. Roman type.

342. **I-I The same**. *Historia naturale, tradocta di lingua latina in florentina per Christophoro Landino*. 413 1. fol. Venice, Nicolaus Jenson, 1476. Hain 13105*. B. M. C. V, 176. Osler 103. Proctor 4099. Census 13105.

343. **I-I The same**. 294 1. fol. Venice, Magister Philippus [Petri], 1481. Hain-Copinger 13106. Stockton-Hough 1257. Census 13106. Gothic type. *See, also* Aurelius Victor.

344. **PORCHASTRIS** [Polcastris] (Sigismundus de) [-1473] Quæstio de restauratione humidi. 6 l. fol. Venice, Peregrinus de Pasqualibus, October 25, 1490. Proctor 4858. Reichling 1326. Gothic type. Porcia (Giacomo). See Purliliarum.
345. **PROGNOSTICON** de mutatione aeris. [Also: Hippocrates. Libellus de medicorum astrologia. Translator: Petrus de Abano.] 49 l. sm. 4°. Venice, Erhard Ratdolt, 1485. Hain-Copinger-Reichling 13393. Proctor 4401. Census 13393. Gothic type. 2 copies.
346. **PSEUDO-AUGUSTINUS**. Sermones ad heremitas. 112 l. 16°. Venice, Simon Bevilacqua, November 4, 1495. Hain-Copinger 2005*. B. M. C. V, 520. Pellechet 1515. Proctor 5395. Voullième: Berlin 4400. G. W. 3007. Census 2005. Gothic type.
347. **PUFF VON SCHRICK** (Michael) [circa 1400-1473] Von den ausgebrannten Wassern. 12 l. sm. 4°. [Strassburg, Martin Schott], vi. Kalendas Novembris (October 27), 1481. Hain 14529*. B. M. C. II, 360. Proctor 1742. Reichling Suppl. 174. Sudhoff 153. Gothic type.
348. I-I The same. fol. Augsburg, Johann Schönsperger, 1484. Hain 14533. Copinger 5320. Sudhoff 160-160a. Census p. 194. Gothic type.
349. **PURLILIARUM** (Jacobus Comes) [Giacomo Porcia]. De generosa liberorum educatione. 18 l. sm. 4°. Treviso, Gerardus [Lisa] de Flandria, September 11, 1492. Hain 13608*. Proctor 6506. Census 13608. Roman type. F.
350. **QUAESTIONES NATURALES** antiquorum philosophorum de generis ciborum. 10 l. sm. 4°. Cologne, Cornelis de Zierikzee, [circa 1500]. Copinger 5004. Proctor 1500. Census p. 182. Gothic type. F. Regimen rusticorum [Fasciculus temporum]. See Rolevinck (Werner).
351. **REGIMEN SANITATIS** salernitanum cum commentario Arnoldi de Villanova. 136 l. sm. 4°. [Louvain, Johannes de Westphalia circa 1480]. Campbell 1469. Pellechet 1279. Census p. 183. Gothic type.
352. I-I The same. 96 l. sm. 4°. [Lyons, Ortuin & Schenk, circa 1485] Hain 13748*. Copinger 5051. Pellechet 1277. Proctor 7418. Census 13748. Gothic type.
353. I-I The same. 80 l. sm. 4°. Strassburg, [Printer of Jordanus of Quedlingburg], December 29, 1491. Hain-Copinger 13758*. Collijn: Stockholm 924. Pellechet 1293. Voullième: Berlin 2246. Census 13758. Gothic type. 2 copies.
354. I-I The same. 58 l. 4°. Paris, Andreas Bocard, XV. kal Decembris (November 17), 1493. Copinger 5069. Pellechet 1295. Census 13760 bis. Gothic type.
355. I-I The same. 66 l. 4°. Paris, Felix Balligault, XV. kal. Decembris (November 17), 1493. Hain-Copinger 13760. Pellechet 1296. Proctor 8246. Census 13760. Gothic type.
356. I-I The same. Noviter impressus. [1480] 40 l. sm. 4°. Venice, Bernardinus de Vitalibus, [circa 1500]. Copinger 5053. Osler 7494. Pellechet 1289. Reichling 708. Census 13748. quater. Roman type.
357. I-I The same. [das ist von der ordnung der gesuntheit] 51 l. folio. Augsburg, Hans Bämmler, April 23, 1472.

Hain 13736*. Proctor 1602. Sudhoff 10. Census 13736. Gothic type. Incomplete.

358. I-I The same. 40 l. fol. Ulm, Conrad Dinckmut, am Samstag nach Sanct Franciscus Tag (October 5), 1482.
Hain 13742. Sudhoff 16. Census 13742. Gothic type. Woodcut representing inspection of leper.
359. **REGIOMONTANUS** (Johannes) [Johann Müller (1436-76)] *Calendarium*. 26 l. sm. 4°. Venice, Erhard Ratdolt, idus Octobris [October 10], 1485.
Hain-Copinger 13779*. Proctor 4405. Census 13779. Gothic type. Astrological diagrams in red and black.
360. **REMONSTRANCES** faites au feu roy Louis XI de ce nom. 14 l. sm. 4°. [n. p., n. d.]
Hain 13869*. Gothic type.
361. **RHAZES**, [860-932]. *Libri ad Almansorem* [Tractatus X medici]. fol. Milan, Leonhard Pachel & Ulrich Scinzenzeler, XVI. Kalendas Martias (February 14), 1481.
Hain-Copinger 13891. Voulliéme: Berlin 3087. Census 13891. Gothic type. F.
362. I-I *Liber nonus ad Almansorem cum additionibus*. [Edidit Silvanus de Nigris] 90 l. fol. Venice, [Bonetus Locatellus] for Octavianus Scotus, April 10, 1490.
Hain 13896*. Proctor 5022. Census 13896. Gothic type.
363. I-I The same. 89. l. fol. Venice, Otinus de Luna, kal Augustis (July 21), 1497.
Hain-Copinger 13897*. Proctor 5605. Census 13897. Gothic type.
364. I-I *Liber dictos Elhavi*. 588 l. fol. Brescia, Jacobus Britannicus, October 18, 1486.
Hain-Copinger 13901*. Proctor 6984. Voulliéme: Berlin 2823. Census 13901. Gothic type. Imperfect.
365. I-I *Opera varia*. [Also: Arnoldus de Villanova: Practica.] 159 l. fol. [Venice], Bonetus Locatellus for Octavianus Scotus, October 7, 1497.
Hain-Copinger 13893*. Proctor 5082. Census 13893. Gothic type.
Riguardati (Benedetto dei). See Benedictus de Nursia.
Roland of Parma. See Capelluti.
366. **RODERICUS ZAMORENSIS** [-1470] *Speculum humane vite*. 150 l. fol. Rome, Conrad Sweynheym & Arnold Pannartz, 1468.
Hain-Copinger. 13939*. Proctor 3292. Census 13939. Roman type.
367. I-I The same. 128 l. fol. Augsburg, Günther Zainer, January 3, 1471.
Hain-Copinger 13940*. Proctor 1525. Census 13940. Gothic type. F.
368. I-I The same. 180 l. 12°. Besançon, Peter Metlinger, 1488.
Hain-Copinger 13947. Proctor 8791. Census 13947. Gothic type.
369. **ROLEVINCK** (Werner) [-1502]. *Fasciculus temporum*. 90 l. fol. [Strassburg, Johann Prüss, not before 1490.]
Hain-Copinger 6916*. Census 8916. Gothic type. Woodcuts.
370. I-I The same. 98 l. sm. 4°. Lyons, Matthias Huss, [-1495.]
Copinger 2437. Proctor 8570. Burger 442. Census 6937 bis. Gothic type.
371. I-I The same. *Ein Cronica von aufang der welt byss aff die jar Christi 1492*. 126 l. fol. [Strassburg, Johann Prüss, after October 27, 1492.]
Hain-Copinger 6940*. Collijn: Stockholm 941. Proctor 549. Voulliéme: Berlin 2392. Census 6940. Gothic type.

372. I-I The same. Fasciculus temporum en françoys, Les fleurs et manieres des temps passees. Translate de latin en françois par Pierre Farget. 44 1. fol. Lyons, Matthias Huss, 1498.
Hain-Copinger 6945. Proctor 8571. Gothic type. Woodcuts. Device of Huss on title-page.
373. **SALEMO**, Episcopus Constantiensis. Glossae 287 1. fol. [Augsburg, Monastery of SS. Ulrich and Afra, 1474-6.]
Hain-Copinger 14134*. Proctor 1636. Census 14134. Roman type. Encyclopedic dictionary in two alphabets, with many medical terms.
374. de **SALICETO** (Guilelmus) [circa 1210-80] Liber in scientia medicinali qui Summa conservationis et curationis appellatur. 178 1. fol. Piacenza, 1476.
Hain-Reichling 14144. Gothic type.
375. I-I The same. [cum chirurgia] 177 1. fol. Venice, Joannes & Gregorius de Gregoriis, May 8, 1490.
Hain-Copinger 14145*. Proctor 4515. Voullième: Berlin 3862. Census 14145. Gothic type. 2 copies. F.
376. I-I Cyrurgia. 50 1. fol. [Piacenza, May 25, 1476.]
Hain-Reichling 14146. Census 14146. Gothic type.
377. I-I The same. La cirogia [Italian text] 118 1. sm. 4°. [n. p.] December 19, 1486.
Reichling 314. Census 14148 *ter*. Roman type.
378. I-I The same. La cirurgie [French text.] 131 1. sm. 4°. Lyons, Matthias Huss, November 16, 1492.
Copinger 5212. Census 14148 *bis*. Gothic type.
379. I-I De salute corporis cum Johannis de Turrecremata tractatu de salute animae. 12 1. sm. 4°. [Mantua, Paulus Joannes de Butzbach, circa 1480.]
Hain-Copinger 14150. Proctor 4014. A Voullième: Köln 540. Census 14150. Gothic type. Title-page woodcut.
380. **SALICETUS** (Nicolaus) Antidotarius animae. 144 1. 4°. Strassburg, Johann Reinhard *alias* Gruninger, March 4, 1493.
Hain-Copinger 14161*. Proctor 463. Census 14161. Gothic type.
381. de **SANCTA SOPHIA** (Marsilius) [circa 1485] Expositio in divi Hippocrates particulam tertiam aphorismorum. 73 1. fol. [Pavia, circa 1472-3.]
382. **SAVONAROLA** (GIOVANNI MICHELE) (1384-1461) De balneis et thermis naturalibus omnis Italiae. 39 1. fol. Ferrara, Andreas de Belfortis, November 10, 1485.
Hain-Copinger 14493*. Proctor 5748. Voullième: Berlin 2865. Census 14493. Gothic type.
383. I-I The same. De omnibus mundi balneis. 40 1. fol. Bologna, for Benedictus Hectoris Faelli, May 13, 1493.
Hain-Copinger 14494*. Burger 437. Proctor 6624. Roman type.
384. I-I The same. 35 1. fol. Venice, Christophorus de Pensis, November 20, [1497].
Hain-Copinger 14492*. Proctor 5241. Census 14492. Roman type.
385. I-I Summa de pulsibus, urinis, et egestionibus. 63 1. fol. Bologna, Henricus de Harlem & Joannes Walbeck, May 8, 1487.
Hain-Copinger 14490*. Proctor 6559. Gothic type.
386. I-I The same. 44 1. fol. Venice, Christophorus de Pensis, February 10, 1497.
Hain-Copinger, 14491*. Census 14491. Roman type.

387. I-I *Opus medicinae seu practica de aegritudinibus*. 264 1. fol. Venice, Andreas de Bonetis, May 10, 1486.
Hain-Copinger 14481*. Proctor 8419. Voulliéme: Berlin 4036. Census 14481. Gothic type.
388. I-I The same. 275 1. fol. Venice, Bonetus Locatellus for Octavianus Scotus, quinto Kal. Julias (June 27), 1497.
Hain-Copinger 14484*. Proctor 5080. Voulliéme: Berlin 4197. Census 14484. Gothic type.
389. I-I *Canonica de febribus*. 111 1. fol. Venice, Christophorus de Pensis, October 16, 1496.
Hain-Copinger 14488*. Proctor 5238. Voulliéme: Berlin 4302. Census 14488. Roman type.
390. I-I The same. [Et alii tractatus]. Bonetus Locatellus for Octavianus Scotus, decimo kalendas Decembres (November 22), 1498.
Hain-Copinger 14489. Proctor 5094. Voulliéme: Berlin 4209. Census 14489. Gothic type.
391. SAVONAROLA (GIROLAMO) (1452-98) *Expositio in psalmum L dum erat in vinculis*. 17 1. sm. 4°. (Ferrara, Lorenzo Rossi, May 1498.)
Hain-Copinger-Reichling 14418. Proctor 5766. Census 14418. Roman type.
392. SCHEDEL (Hartmann) *Liber chronicarum*. 325 1. fol. (Nuremberg, Anton Koberger, July 12, 1493).
Hain-Copinger 14508*. B. M. C. II, 437. Proctor 2084. Census 14508. Gothic type.
Schrack (Michael). See Puff von Schrick.
393. SCOTUS (Michael) [*circa* 1175-1234] *Liber physionomiae et procreationis*. 77 1. 4°. [Venice, Jacobus de Fivizzano], 1477.
Hain-Copinger 14550*. Proctor 4364. Voulliéme: Berlin 3766. Census 14550. Roman type. F.
394. I-I The same. 45 1. 4°. [Treviso or Venice? Joannes Rubeus, 1483.]
Hain-Copinger 14546*. Proctor 5128. Census 14546. Roman type.
395. I-I The same. 34 1. sm. 4°. [Basel, Michael Wenssler, *circa* 1480.]
Hain-Reichling 14543. Census 14543. Gothic type. F.
396. I-I The same. 39 1. sm. 4°. [n. p., n. d.]
Hain-Copinger 14542. Roman type.
397. I-I *Expositio super auctorem sphaerae cum quaestionibus*, i. 40 1. sm. 4°. Bologna, Justinianus de Ruberia, September 16, 1495.
Hain-Copinger 14555*. Proctor 6661. Census 14555. Gothic type. See also *Mensa philosophica*.
398. SCRIPTORES REI RUSTICAE. *Opera agricolationum: Columellae, Varronis Catonisque, nec non Palladii, cum excriptionibus Philippi Beroaldi et commentariis quae in aliis impressionibus non extant*. 274 1. fol. Bologna, Benedictus Hectoris, Faelli, October 13, 1494.
Hain-Copinger 14568*. Census 14568. Roman type.
399. SENECA (Lucius Annaeus) [*circa* 4 B. C.-65 A. D.] *Omnia opera*. 208 1. fol. Venice, Bernardinus de Coris, die ultima Octobris (October 31), 1492.
Hain-Copinger 14594*. Proctor 5221. Census 14594. Roman type. F.
400. SERAPION, JUNIOR [11th Century] *Aggregator in medicinis simplicibus*. 136 1. fol. Venice, Reynaldus de Novimagio (Reynald of Nijmegen), June 8, 1479.
Hain-Copinger 14692*. Proctor 4433. Census 14692. Gothic type.

401. I-I The same. 185 11. Milan, Antonius Zarotus, August 4, 1473.
Hain-Copinger 14691*. Proctor 5775. Voulliéme: Berlin 3028. Census 14691.
Roman type.
402. SERAPION SENIOR [9th Century] Brevarium medicinae. 149
1. fol. Venice, Reynaldus de Novimagio, in kalendis mensis
augusti (August 1), 1479.
Hain-Copinger 14693*. Proctor 4134. Census 14693. Gothic type.
403. I-I The same. Practica dicta breviarum. 211 1. fol. Venice, Bone-
tus Locatellus, for Octavianus Scotus, 17 kal. Januarias (De-
cember 16, 1497.)
Hain 14695*. B. M. C. V, 448. Proctor 5084. Census 14695. Gothic type. F.
404. SERENUS SAMMONICUS (Quintus) [3rd Century A.D.] Liber
medicinae [Editor. Sulpitius Verulanus.] 26 l. sm. 4°. [Rome,
Georgius Herolt, circa 1481.]
Hain-Copinger 14698. Collijn: Upsala 1347. Proctor 3950. Census 14698.
Roman type. F.
405. SERMONETA (Johannes) Quaestiones super librum aphoris-
morum ejusdem super librum Tegni. 73 1. fol. Venice, Bonetus
Locatellus for Octavianus Scotus pridie Kal. apriles (March
31), 1498.
Hain 14701*. B. M. C. V, 450. Proctor 5086. Census 14701. Gothic type. F.
406. SILVATICUS (Mattheus) [13th-14th Century] Liber pandecta-
rum medicinae. 235 1. fol. Venice, Johann of Cöln & Johann
Manthen, October 10, 1480.
Hain 15198*. Proctor 4347. Census 15198. Gothic type.
407. I-I The same. 307 1. fol. Strassburg, Adolph Rusch (The R-
printer), circa 1470-80.
Hain-Copinger 15192*. Proctor 251. Voulliéme: Berlin 2128. Census 15192.
Gothic type. F.
408. I-I The same. 321 1. fol. Vicenza, Hermann Lichtenstein, [circa
1480].
Hain 15193*. Osler 205. Census 15193. Gothic type.
409. I-I The same. 193 1. fol. Venice, Philippus Pinzius for Bernar-
dinus Fontana, June 16, 1492.
Hain 15201*. Proctor 5292. Voulliéme: Berlin 4343. Census 15201. Gothic
type.
410. I-I The same. 154 1. fol. Venice, Bernardinus Stagninus, March
27, 1499.
Hain-Copinger 15199*. Proctor 4840. Voulliéme: Berlin 4058. Census 15199.
Gothic type.
411. SIMON GENUENSIS [Simone Cordo] (1270-1303) Clavis sana-
tionis seu synonyma medicinae. 157 1. fol. Milan, Antonius
Zarotus, August 3, 1473.
Hain-Copinger 14747. Proctor 5774. Voulliéme: Berlin 3027. Census 14747.
Roman type. F.
412. I-I The same. 98 1. fol. Venice, Guilelmus de Tridino, November
13, 1486.
Hain-Copinger 14749*. Proctor 5109. Voulliéme: Berlin 4217. Census 14749.
Gothic type. Maps. See, also, Abulcasim.
413. SOLDUS (Jacobus) [-circa 1440]. Opus de peste. 361 1. 4°.
Bologna, Johann Schreiber, 1478.
Hain-Copinger 14870*. Klebs: Pest 98. Proctor 6548. Voulliéme: Berlin 2736.
Census 14870. Gothic type.

414. **STEBER** (Bartholomæus) A mala franczos morbo gallorum praeservatio ac cura. 8 l. sm. 4°. [Vienna, Johannes Winterburg, 1497-8].
Hain-Copinger 15053. B. M. C., III, 811. Proctor 9483. Voulliéme: Berlin 2684. Census 15053. Gothic type. Title-page woodcut.
415. **STEINHÖWEL** (Heinrich) [1420-82]. Büchlein der Ordnung der Pestilenz. 20 l. fol. Ulm, Conrad Dinckmut, [circa 1482].
Hain 15057. Klebs: Pest 104. Proctor 2560A Sudhoff 191. Voulliéme: Berlin 2660, 3. G. W. (Nachträge zu Hain 336). Census 15057. Gothic type.
416. **THEMISTIUS PERIPATETICUS**. Paraphrasis in posteriora analitica Aristotelis interprete Hermolao Barbaro. [De divinatio in somno.] 168 l. fol. Treviso, B. Cofolonerius & Morellus Gerardinus de Salodio, February 15, 1481.
Hain-Copinger 15463*. Proctor 6488. Census 15463. Gothic type.
417. I-I The same. fol. Venice, Bartholomæus de Zanis, pridie nonas Octobris (October 4), 1499.
Hain-Copinger 15464*. Proctor 5344. Roman type.
418. **THEOBALDUS EPISCOPUS**. Physiologus Theobaldi Episcopi de naturis duodecim animalium. 17 l. sm. 4°. [Leipzig, Conrad Kachelofen, n. d.]
Hain 15470*. Proctor 2922. Gothic type.
419. de **THIENIS** (Cajetanus) Expositio in libros Aristotelis de coelo et mundi. 108 l. fol. Venice, 1484.
Hain-Copinger-Reichling 15500. Proctor 5685. Census 15500. Gothic type.
420. I-I Recollecta super octo libros physicorum cum annotationibus textuum. fol. Venice, Bonetus Locatellus for Octavianus Scotus, nonis sextilibus, 1496.
Hain-Copinger 15498. Pellechet-Polain 4946. Proctor 5071. Census 15498. Gothic type. Stamped pigskin binding.
421. I-I Gaetano de coelo et mundi. 76 l. fol. Venice, Otinus de Luna, October 3, 1498.
Hain-Copinger 15501*. Collijn: Upsala 575. Proctor 5609. Census 15501. Gothic type.
422. de **TORNAMIRA** (Johannes) Clarificatorium super nono Almansoris cum textu Rhasis. 172 l. fol. Lyons, Johannes Trechsel, 1490.
Hain-Copinger 15551*. Proctor 8598. Census 15551. Gothic type. F. della Torre (Giacomo). See Jacobus Foroliviensis.
423. **TORRELLA (CASPAR)** De morbo gallico cum alijs. [Also: Pro regimine seu preservatione sanitatis.] 22 l. sm. 4°. Rome, Petrus de Turre, circa 1497.
Hain 15557. Census 15557. Gothic type.
424. I-I Dialogus de dolore, cum tractatu de ulceribus in pudendagra evenire solitis. 60 l. sm. 4. Rome, Joannes Besicken & Martinus de Amsterdam, 1500.
Hain 15559. Proctor 4000. Census 15559. Gothic type.
425. **TORRELLA (HIERONYMUS)** De imaginibus astrologicis. 93 l. sm. 4°. Venice, Alfonso de Orto, [after December 1, 1496].
Hain-Copinger 15560. Proctor 9507. Census 15560. Gothic type. F.
426. **TRACTATUS DESCRIPTIONUM MORBORUM** in corpore humanorum existentium [Also: Arnoldus de Villanova: Tractatus de virtutibus quercus.] 11 l. 4°. [Memmingen, Albrecht Kunne], 1496.
Hain 6096*. B. M. C. II, 606. Proctor 2798. Census 6096. Gothic type.
427. **TRANENSIS** (Petrus) [Pietro Palagari]. De ingenuis puerorum

- et adolescentium moribus. 52 l. sm. 4°. Ferrara, Laurentius [de Rubeis] de Valentia, October 7, 1496.
Hain-Copinger-Reichling 15597. Proctor 5761. Census 15597. Gothic type.
428. TROMBETTA (Antonius) Tractatus de humanarum animarum purificatione ad Catholice fidei obsequium. 31 l. fol. Venice, Bonetus Locatellus, October 25, 1498.
Hain-Copinger 15646. Collijn: Upsala 1458. Proctor 5092. Gothic type.
429. TURAN DE CASTELLO. Tractatus de balneis [seu de thermis]. 11 l. 4°. Sant [orso], Johannes de Reno, March 4, 1473.
Hain 4592*. Hain 7571. Census 4592. Roman type. F.
430. TUSSIGNANO (Pietro de) [-circa 1400]. Tractatus de peste anni 1398. 28 l. 4°. [Venice, F. di Pietro or Christophorus Valdarffer, circa 1475.]
Compare Hain-Copinger 15750*. Klebs: Pest 109. Census 15750. Roman type.
- [Ulsenius (Theodorus) De pharmacandi comprobata ratione (Nuremberg, 1496) (Hain 16088) See Hippocrates.]
431. VALASCUS DE TARENTA [-circa 1418]. De epidemia et peste. 14 l. fol. Basel, Martin Flach, [circa 1470.]
Hain-Copinger 15244*. Klebs: Pest 120. Proctor 7552. Voullième: Berlin 424. Census 15244. Gothic type. F.
432. I-I The same. 14 l. sm. 4°. Hagenau, Heinrich Gran, feria quinta ante festum Sancte Katherine (November 23), 1497.
Hain 15247*. B. M. C. III. 685. Klebs: Pest 126. Proctor 3190. Voullième: Berlin 1178. Census 15247. Gothic type.
433. I-I Practica quae alias Philonium dicitur. 267 l. fol. Lyons, Matthias Huss, November 20, 1490.
Hain-Copinger 15251. Collijn: Upsala 1465. Pellechet: Lyon 544. Gothic type.
434. I-I The same. 368 l. sm. 4°. [Lyons], Nicolaus Wolff, March 10, 1500.
Hain-Copinger 15252*. Günther: Leipzig 1715. Census 15252. Gothic type.
435. VALLA (Giorgio) Interpretationes variae. [Nicephori: Logica [etc.]] 156 l. fol. Venice, Simon Bevilaqua, September 30, 1498.
Hain-Copinger 11748*. Proctor 5408 Voullième: Berlin 4410 Census 11748. Roman type. Bound as "Nicephorus." F. See, also Alexander of Aphrodisias.
436. de VARGAS (Alphonsus) Quaestiones super libros Aristotelis de anima. fol. Florence, Nicolaus Laurentii, July 25, 1477.
Hain-Reichling 877. Proctor 6113. Gothic type.
437. VEGETIUS (Flavius Renatus) De re militare. [Also: military treatises by Frontinus, Modestus, Aelian and Onosander]. 104 l. sm. 4°. Rome, Eucharius Silber, October 24-November 3, 1494.
Hain-Copinger 15915*. Census 15915. Roman type.
438. VERSEHUNG, Leib, Seel, Ehr und Gut. 182 l. 4°. Nuremberg, Peter Wagner, 14[89].
Hain-Copinger 16019*. B. M. C. II, 463. Proctor 2244. Sudhoff 230. Voullième: Berlin 1873. Census 16019. Gothic type. Title-page woodcut. F.
439. I-I The same. 166 l. 12°. Augsburg, Hans Schobsser, 1490.
Hain-Copinger 16020. Proctor 1866. Sudhoff 231. Voullième: Berlin 279. Gothic type.
- Viccomes, See Hieronymus Viccomes.
440. VINCENTIUS BELLOVACENSIS (Vincent de Beauvais) [-1264]. Speculum naturale. 2 v. fol. [Nuremberg, Anton Koburger, 1485-6].
Copinger 6257. Collijn: Upsala 1493. Proctor 2056. Voullième: Bonn 1236. Census p. 218. Gothic type. Illuminated initials.

441. **VOCABULARIUM LATINO-GERMANICUM** in LXII articulos de homine, ejus conditionibus et variis ad ipsum concernentibus tractantes distributum. 138 l. fol. [Augsburg, Günther Zainer, *circa* 1470-73].
Panzer I, 133. Census p. 219. Gothic type.
442. **WIDMAN** (Johann) Tractatus de pustulis et morbo qui vulgato nomine de franzos appellatur. 10 l. sm. 4°. [Strassburg, Johann Grüninger, after February 1, 1497.]
Hain-Copinger 16160*. Copinger III, 6573. Proctor 478. Voullième: Berlin 2332. Census 16160. Gothic and Roman type.
443. **WIRECKER** (Nigellus) Liber qui intitulator Brunellus in speculo stultorum. 60 l. sm. 4°. [Leipzig, Conrad Kachelofen, n.d.]
Hain-Copinger 16217*. Proctor 2904. Census 16217. Gothic type. Initial woodcut. Original stamped leather binding. F.
444. **ZENO** (Antonius) De natura humana. 149 l. sm. 4°. Venice, Dionysius Bertochus Bononiensis, January 1, 1491-2.
Hain 16281*. Proctor 5278. Census 16281. Gothic type. F.
445. **ZERBI** (Gabriele) Gerontocomia. sm. 4°. Rome, Eucharius Silber, November 27, 1489.
Hain 16284. Proctor 3840. Reichling VI, p. 181. Voullième: Berlin 3486. Census 16284. Gothic type.
446. **I-I De cautelis medicorum**. 16 l. sm. 4°. Venice, Christophorus de Pensis, *circa* 1495.
Hain-Copinger 16286. Proctor 5235. Census 16286. Roman type.

FIELDING H. GARRISON.

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- Dürken, B. *Grundriss der Entwicklungsmechanik*.
Berlin, Borntraeger, 1929, 208 p.
- Effler, L. R. *Three minute medicine*.
Boston, Badger, [1929], 453 p.
- Elwyn, A. *Yourself, inc.*
N. Y., Brentano, [1930], 320 p.
- Ernst, G. & Broichmann, H. J. *Rheuma und Rheumabekämpfung*.
Jena, Fischer, 1929, 88 p.
- Fearing, R. *Reflex action*.
Balt., Williams, 1930, 350 p.
- von Fekete, A. *Die Funktion der weiblichen Geschlechtsorgane*.
Berlin, Karger, 1930, 278 p.
- Fishbein, M. *Shattering health superstitions*.
N. Y., Liveright, 1930, 245 p.
- Fodor, A. *Das Fermentproblem*. 2. Aufl.
Dresden, Steinkopff, 1929, 283 p.
- Foundations of experimental psychology*, ed. by C. Murchison.
Worcester, Clark Univ. Pr., 1929, 907 p.
- Fowler, R. H. *Tonsil surgery*.
Phil., Davis, 1930, 288 p.
- Francfort, G. *Traitement des colibacillooses urinaires*.
Paris, Doin, 1930, 133 p.
- Fribourg-Blanc, A. *Le traitement de la paralysie générale et du tabès
par la malaria provoquée*.
Paris, Masson, 1929, 120 p.
- Fujii, M. *To physicians of the world*.
Tokyo, "Yoseikaku," 1929, 130 p.
- Gates, R. R. *Heredity in man*.
N. Y., Macmillan, 1929, 385 p.
- von Gerhardt, A. *Handbuch der Homöopathie*. 12. Aufl.
Leipzig, Schwabe, 1929, 624 p.

- Glueck, S. & Glueck, E. T. Five hundred criminal careers.
N. Y., Knopf, 1930, 365 p.
- Goldbacher, L. Hemorrhoids, the injection treatment and pruritus ani.
Phil., Davis, 1930, 205 p.
- Goldscheider, A. Therapie innerer Krankheiten.
Berlin, Springer, 1929, 420 p.
- Gortner, R. A. Outlines of biochemistry.
N. Y., Wiley, 1929, 793 p.
- Grotjahn, A. Aerzte als Patienten.
Leipzig, Thieme, 1929, 274 p.
- Harper, P. T. Clinical obstetrics.
Phil., Davis, 1930, 629 p.
- Harris, M. C. & Finesilver, B. Normal facts in diagnosis.
Phil., Davis, 1930, 247 p.
- Havelock Ellis, in appreciation, ed. by J. Ishill.
Berkeley Heights, Oriole Pr., 1929, 299 p.
- Hetzer, H. Kindheit und Armut.
Leipzig, Hirzel, 1929, 314 p.
- History of nursing and sociology; compiled by a Sister of charity.
[Bridgeport, Brewer-Colgan Co., 1929], 279 p.
- Hofstätter, R. Die arbeitende Frau.
Wien, Perles, 1929, 516 p.
- Hull, T. G. Diseases transmitted from animals to man.
Springfield, Thomas, 1930, 350 p.
- Jaquet, A. Ein halbes Jahrhundert Medizin.
Basel, Schwabe, 1929, 328 p.
- Jennings, H. S. The biological basis of human nature.
N. Y., Norton, [1930], 384 p.
- Juster, E. Traitement des affections neuro-cutanées.
Paris, Masson, 1929, 126 p.
- Kankeleit, O. Die Unfruchtbarmachung aus rassenhygienischen und sozialen Gründen.
München, Lehmann, 1929, 112 p.
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Phil., Lippincott, [1930], 627 p.
- Kollert, V. Grundlagen der ätiologischen Behandlung der Nierenentzündungen.
Leipzig, Deuticke, 1929, 161 p.
- Kuczyński, M. H. Der Erreger des Gelbfiebers.
Berlin, Springer, 1929, 191 p.
- Küstner, H. Fortpflanzungsschädigung der erwerbstätigen Frau und ihre Abhilfe.
Leipzig, Barth, 1930, 124 p.
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N. Y., Day, [1930], 214 p.

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Madrid, Sanchez de Ocaña, 1929, 221¹ p.
- Lane, (Sir) W. A. Blazing the health trail.
London, Faber, 1929, 148 p.
- Lepoutre, C. Bactériuries, pyélites et pyélonéphrites.
Paris, Doin, 1930, 245 p.
- Liniger, H. & Molineus, G. Der Unfallmann. 2. Aufl.
Leipzig, J. A. Barth, 1930, 159 p.
- Lorimer, F. The growth of reason.
N. Y., Harcourt, 1929, 231 p.
- McDonald, A. L. Essentials of surgery. 4. ed.
Phil., Lippincott, [1929], 295 p.
- MacNevin, M. G. & Vaughan, H. S. Mouth infections and their relation to systemic diseases.
N. Y., J. Purcell research memorial, 1930, v. 1.
- Maloy, B. S. Legal anatomy and surgery.
Chic., Callaghan, 1930, 804 p.
- Mansfield, W. Microscopic pharmacognosy.
N. Y., Wiley, 1929, 211 p.
- Mendelsohn, M. Die alkoholischen Getränke und der menschliche Organismus.
Berlin, Reiss, 1930, 191 p.
- Metcalf, L. & Eddy, H. P. Sewerage and sewage disposal.
N. Y., McGraw-Hill, 1930, 783 p.
- Millikan, R. A. Science and the new civilization.
N. Y., Scribner, 1930, 194 p.
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- Moral, H. Untersuchungen an künstlichen Zähnen.
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- Morel, F. L'hyperostose frontale interne.
Paris, Doin, 1930, 92 p.
- Norris, C. C. Uterine tumors.
N. Y., Harper, 1930, 251 p.
- Nowikoff, M. Das Prinzip der Analogie und die vergleichende Anatomie.
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- Noyes, F. B. A text-book of dental histology and embryology. 4. ed.
London, Kimpton, 1930, 527 p.
- Oesterreich, T. K. Possession, demoniacal and other.
London, Paul, 1930, 400 p.
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- Ostwald, W. Die pyramide der Wissenschaften.
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London, Churchill, 1930, 678 p.

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München, Delphin-Verlag, [1929], 223 p.
- Piney, A. & Wyard, S. *Clinical atlas of blood diseases.*
London, Churchill, 1930, 98 p.
- Planer, R. *Leitfaden der homöopathischen Therapie der Geschlechtskrankheiten und Krankheiten der Geschlechtsorgane.*
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- Pottenger, F. M. *Symptoms of visceral disease.* 4. ed.
St. Louis, Mosby, 1930, 426 p.
- Potts, J. *Getting well and staying well.* 2. ed.
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Luzern, Konegen, [1930], 141 p.
- Psychological register, ed. by C. Murchison.
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- Pütter, A. *Die Sekretionsmechanismen der Niere.*
Berlin, de Gruyter, 1929, 235 p.
- Putnam, S. *François Rabelais; a man of the renaissance.*
N. Y., Cape, [1929], 530 p.
- Rhinehart, D. A. *Roentgenographic technique.*
Phil., Lea, [1930], 388 p.
- Robinson, V. *Pathfinders in medicine.* [2. ed].
N. Y., Medical Life Pr., 1929, 810 p.
- Sadler, W. S. *The cause and cure of colds.* 7. ed.
Chic., Rockwell, 1930, 172 p.
- Sansum, W. D. *The normal diet.* 3. ed.
St. Louis, Mosby, 1930, 134 p.
- Scammon, R. E. & Calkins, L. A. *The development and growth of the external dimensions of the human body in the fetal period.*
Minneapolis, Univ. of Minn. Pr., 1929, 367 p.
- Schäffer, J. *Behandlung der Haut- und Geschlechtskrankheiten.* 7. Aufl.
Berlin, Urban, 1929, 468 p.
- Schmid, G. *Traumbilder des Schlaf- und Wachzustandes.*
Böslingen, Schlecht, 1929, 351 p.
- Schmidt, P. *Nicht müde sein!*
Leipzig, List, [1929], 125 p.
- Schneider, C. *Die Psychologie der Schizophrenen.*
Leipzig, Thieme, 1930, 301 p.
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Dresden, Verlag des deutschen Hygiene-Museums, 1929, 101 p.
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Wien, Springer, 1929, 215 p.

- Snyder, L. H. Blood grouping in relation to clinical and legal medicine.
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London, Longmans, 1930, 320 p.
- Sudhoff, K. Biologie und Medizin im Wandel der Zeiten.
Leipzig, Fock, 1929, 221 p.
- Swift, E. J. The psychology of childhood.
N. Y., Appleton, 1930, 431 p.
- Taliaferro, W. H. The immunology of parasitic infections.
N. Y., Century, [1929], 414 p.
- Volckelt, J. Versuch über Fühlen und Wollen.
München, Beck, 1930, 130 p.
- Wallace, R. Health without fads.
London, Methuen, [1930], 120 p.
- Webb-Johnson, C. Nerve troubles, causes and cures.
N. Y., Stokes, [1929], 94 p.
- White, W. C. Cancer of the breast.
N. Y., Harper, 1930, 221 p.
- Wilbrand, H. Der Faserverlauf durch das Chiasma.
Berlin, Karger, 1929, 53 p.
- Williams, E. H. The doctor in court.
Balt., Williams, 1930, 289 p.
- Wolff, T. Der Wettlauf mit der Schildkröte.
Berlin, Scherl, [1929], 383 p.

PROCEEDINGS OF ACADEMY MEETINGS

MAY

STATED MEETINGS

Thursday Evening, May 1, at 8:30 o'clock

Program presented in cooperation with the

COMMITTEE ON THE HEALTH OF SCHOOL CHILDREN

of the

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK

I. EXECUTIVE SESSION

Election of Fellows

II. PAPERS OF THE EVENING

- a. The White House conference on child health, Samuel McC. Hamill, Chairman Section on Medical Service
 - b. The pre-school medical examination and the practicing physician, Shirley W. Wynne, Commissioner of Health, City of New York
 - c. Child mentality and adult disease, Auguste Ley, Professor of Psychiatry, University of Brussels, President of the Belgian League for Mental Hygiene
 - d. Immunization against measles, William Hallock Park, Director Bureau of Laboratories, City of New York
- Discussion opened by Alec N. Thomson, Secretary Public Health Committee, Medical Society, County of Kings

Thursday Evening, May 15, at 8:00 o'clock

Please note change of hour

THE EIGHTH HARVEY LECTURE

(Twenty-fifth Anniversary meeting of the founding of the Society)

"The Progress of Medicine during the Past Twenty-five Years, as exemplified by the Harvey Lectures"

RUFUS I. COLE

Director of the Rockefeller Institute for Medical Research,
New York City

The "Harvey Film," executed by Sir Thomas Lewis and
Dr. H. H. Dale will be shown

G. CANNY ROBINSON, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for May.

SECTION OF SURGERY

Friday Evening, May 2, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Otto C. Pickhardt

For Secretary—Robert H. Kennedy

For one member of Advisory Committee—William C. White

Reading of the Minutes

II. PRESENTATION OF CASES

a. Traumatic rupture of spleen—splenectomy (two cases), Harold J. Shelley (by invitation)

b. 1. Compound fracture of femur with operation, followed by loss of 4½ inches of shaft of bone

2. Fracture-dislocation of elbow, open operation, early result. Nelson W. Cornell

III. PAPERS OF THE EVENING

a. Mal-union of the femur, Russel H. Patterson

b. Irradiated ergosterol in the treatment of fractures in adults, Kenneth M. Lewis

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Tuesday Evening, May 6, at 7:45 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Walter J. Highman

For Secretary—A. Benson Cannon

For one member of Advisory Committee—Jerome Kingsbury

II. PRESENTATION OF PATIENTS

Miscellaneous cases

III. DISCUSSION OF CASES

Harry C. Saunders

NOTE: Examination of cases is limited to members and their invited guests

SECTION OF PEDIATRICS

Thursday Evening, May 8, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Hugh Chaplin

For Secretary—John Caffey

For one member of Advisory Committee—F. Elmer Johnson

II. PAPERS OF THE EVENING

a. The pneumonias of childhood. A five year study from Bellevue Hospital, Charles Hendee Smith, Alfred G. Langmann, Elizabeth Torrey (by invitation), A. R. Harnes (by invitation)

b. The bacteriology of pneumonia in childhood. A two year study from Bellevue Hospital, Antoinette Raia (by invitation), Norman H. Plummer (by invitation), Selma M. Shultz, A.B. (by invitation)

General discussion opened by

- a. Clinical aspect, Howard H. Mason
- b. Pathology, Martha Wollstein
- c. Bacteriology, William H. Park, Russell L. Cecil

SECTION OF OTIOLOGY

Friday Evening, May 9, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Hugh B. Blackwell

For Secretary—Renè Hector Huvelle

For one member of Advisory Committee—James G. Dwyer

Reading of the Minutes

II. PRESENTATION OF CASE

Showing hearing result obtained after right radical operation compared with result obtained after left modified radical operation, Clarence H. Smith

III. REPORT OF CASES

Report of case of double mastoid infection caused by type three pneumococcus mucosis, Stuart L. Craig

Report of two cases of retropharyngeal abscess pointing in the external auditory canal, Edgar M. Pope (by invitation)

A case of petrous bone abscess drained through the middle ear, Wesley C. Bowers

IV. PAPER OF THE EVENING

A plea for the more frequent use of local anesthesia in mastoidectomy, Lester Mead Hubby

SECTION OF NEUROLOGY AND PSYCHIATRY

Joint meeting with the

NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, May 13, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of officers of the Section of Neurology and Psychiatry:

For Chairman—Michael Osnato

For Secretary—Joseph H. Globus

For members of the Advisory Committee—Moses Keschner, to serve 5 years; Irving H. Pardee, to serve 4 years, to fill the unexpired term of Junius W. Stephenson

Reading of the Minutes

II. PAPERS OF THE EVENING

Measurements of cerebral and cerebellar surfaces. The measurements of motor area in some vertebrates and man. Charles Davison (by invitation), J. J. Michaels (by invitation)

Discussion, Charles Elsberg, Byron Stookey, Walter M. Kraus

III. CLINICO-PATHOLOGICAL PRESENTATION

(From the Neurologic Service of Mount Sinai Hospital) (lantern slides)

- a. Acute pericapillary encephalorrhagia (salvasan encephalitis hemorrhagica)
- b. Cysticercus of the brain
- c. Pituitary cachexia (Simmond's disease)
- d. Tumor of the pineal body
- e. Niemann-Pick disease, Israel Strauss, Joseph H. Globus

General discussion

General discussion, Louis Casamajor, Moses Keschner, Lewis Stevenson, Samuel Brock

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, May 14, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Frederick Peterson

For Secretary—Howard Reid Craig

For one member of Advisory Committee—Ira Otis Tracy

II. PAPERS OF THE EVENING

- a. History of the colony for insane at Iwakura, Japan. (Lantern illustrations), Shuzo Kure (by invitation)
- b. History of the Gheel, Belgium, colony for the insane. (Lantern illustrations), F. Sano (by invitation)
- c. Notes on William Beaumont, Harris A. Houghton

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, May 16, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Alan DeF. Smith

For Secretary—Isadore Zadek

For one member of Advisory Committee—Armitage Whitman

Readin' of the Minutes

II. PAPERS OF THE EVENING

- a. New operation for the relief of genu-curvatum, Leo Mayer
- b. Spondylolisthesis, with report of four cases, Samuel Kleinberg
- c. Operation for the relief of recurrent dislocation of the shoulder; with report of twenty cases, Tóufick Nicola (by invitation)

SECTION OF OPHTHALMOLOGY

Sunday Evening, May 19, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Ernest F. Krug

For Secretary—William F. C. Steinbugler

For one member of Advisory Committee—John M. Wheeler

Reading of the Minutes

II. PRESENTATION OF CASES

- a. Unusual muscle anomaly following radical frontal operation, James Watson White
- b. Intrasccleral nerve loupes (lantern slides), Algernon B. Reese
- c. Thrombosis of the carotid and middle cerebral with bilateral hemorrhagic optic neuritis, Sigmund A. Agatston
- d. Two cases of foreign bodies in the lens, Elias J. Marsh
- e. Preretinal hemorrhage, Guersney Frey

III. DEMONSTRATION

- a. Trachomatous infiltration of the Denig transplant, Benjamin Friedman (by invitation)
- b. Hand magnet, Clyde E. McDannald

IV. PAPERS OF THE EVENING

- a. The central nervous system control of the ocular movements and the disturbances of this mechanism, Henry Alsop Riley
- b. Local signs in late glioma, Gordon M. Bruce (by invitation)
- c. Simple inexpensive method of making macroscopical eye specimens, E. B. Burchell (by invitation)

SECTION OF MEDICINE

Tuesday Evening, May 20, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Arthur H. Terry, Jr.

For Secretary—Harold E. B. Pardee

For one member of Advisory Committee—George Baehr

II. PAPERS OF THE EVENING

- a. The use of scillaren in cardiac disease, John J. H. Keating
- b. Significance of a large Q wave in lead 3, Harold E. B. Pardee
- c. Significance of low voltage T waves, Arthur M. Master
- d. Stages preceding gross pathology in the digestive tract, A. L. Soresi
- e. Chronic pulmonary atelectasis, Milton S. Lloyd (by invitation)

III. GENERAL DISCUSSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, May 21, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—Thomas J. Kirwin

For Secretary—Meredith F. Campbell

For one member of Advisory Committee—Stanley R. Woodruff
Reading of the Minutes

II. PRESENTATION OF CASE REPORTS BY UROLOGICAL DEPARTMENT OF THE NEW YORK HOSPITAL

- a. Vesico-ureteroplasty for relief of hydronephrosis and hydro-ureter, R. R. Callaway (by invitation) (5 minutes)
- b. Papilloma of the pelvis of the kidney, F. N. Kimball (by invitation)
- c. Calculi in ectopic kidney, F. P. Twinem (by invitation) (5 minutes)
- d. Heminephrectomy for hypernephroma, papilloma and stone occurring in a horse shoe kidney, J. K. De Vries (by invitation) (10 minutes)
- e. Regional anesthesia as applied to urological surgery, R. B. Henline (15 minutes)
- f. New incision for operations upon the urinary bladder (lantern slide demonstration), O. S. Lowsley (20 minutes)
- g. Complete accidental cutting of ureter during operation, non-surgical anastomosis, F. T. Lau (10 minutes)
- h. Statistical review of deaths from cancer of the kidney, bladder and prostate 1917-1928, John Duff (10 minutes)
- i. Report of experiences in the treatment of inoperable and post operative cases of tuberculosis of the urinary tract, Stanley Wang (by invitation) (10 minutes)
- j. Papillary carcinoma of kidney pelvis—operation, cure, H. A. Lyons (10 minutes)
- k. Reports from children's clinic
 - a. Urolithiasis in a boy of 9 months
 - b. Double kidney with infection in a girl of 5 years, P. M. Butterfield (10 minutes)
- l. Bilateral recurrent calculi of the lower ureters, G. A. Fiedler (by invitation) (10 minutes)
- m. Biopsy by needle puncture and aspiration in prostatic tumors, R. S. Ferguson (by invitation) (5 minutes)
- n. Uretero nephrectomy with presentation of case, Robert Gutierrez

III. GENERAL DISCUSSION

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, May 27, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—David N. Barrows

For Secretary—Gerard L. Moench

For one member of Advisory Committee—W. E. Caldwell

Reading of the Minutes

II. PRESENTATION OF INSTRUMENTS

New respirator for the treatment of asphyxia neonatorum. Exhibition of apparatus and lantern slides, Douglas P. Murphy (by invitation)
 Discussion by Paluel J. Flagg (by invitation) Michael G. Mulinos, Pol. N. Coryllos

III. PAPERS OF THE EVENING

a. Fundamental bio-chemical factors in pregnancy, Max Trumper (by invitation) Abraham Cantarow

Discussion by, J. A. Kilian, Ph.D. (by invitation), Isidore C. Eisenberg, Michael G. Mulinos, Percy H. Williams (by invitation)

b. Etiological factors in carcinoma of the cervix, Frank K. Smith (by invitation)

Discussion by James Ewing

IV. GENERAL DISCUSSION

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, May 28, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

Election of Officers:

For Chairman—John M. Loré

For Secretary—Robert E. Buckley

For one member of Advisory Committee—Harmon Smith

Reading of the Minutes

II. PAPERS OF THE EVENING

a. Typical and atypical pains in the head; practical considerations, Samuel Brock

b. Oral surgery of interest to the rhinologist. (Illustrated with lantern slides), Theodor Blum

c. Some nose and throat observations in Labrador (motion pictures), John D. Kernan

III. GENERAL DISCUSSION

NEW YORK PATHOLOGICAL SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Thursday Evening, May 22, at 8:30 o'clock

ORDER

I. EXECUTIVE SESSION

II. PAPERS OF THE EVENING

a. A standardized method for cutting cardiac material, Louis Gross, Benjamin Sacks, William Antopol

b. Some findings in rheumatic hearts to illustrate the value of the standardized sections, William Antopol, Louis Gross, Benjamin Sacks

c. Placenta increta, B. Kwartin, N. Adler (by invitation)

- d. Further studies on arteriolo-necrosis of the kidneys, Paul Klempner, Sadao Otani (by invitation)

LEILA CHARLTON KNOX, President, St. Luke's Hospital

BERYL H. PAIGE, Secretary, The Presbyterian Hospital

NEW YORK MEETING

of the

SOCIETY OF EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Fifth Avenue and 103 Street

Wednesday, May 21, at 8:15 p.m.

(Program incomplete)

- I. Studies in gastric analysis in children, I. S. Wright, A. G. DeSanctis, J. A. Killian
- II. On the dialysability of proteins, A. F. Coca
- III. Inorganic salts in nutrition. III. Some effects of replacing inorganic salts in a ration poor in ash, P. P. Swanson, R. V. Schultz, A. H. Smith
- IV. Observations on the mechanism of chloride retention in pneumonia, I. Greenwald
- V. Quantitative biological effects of monochromatic ultraviolet light, I. Weinstein, introduced by H. B. Williams
- VI. On the mechanism of chemotherapeutic action. I. Formation of the parasitotropic agent from arsenicals, L. Reiner, C. S. Leonard
- VII. Experimental chronic hyperparathyroidism in dogs leading to ostitis fibrosa cystica, H. L. Jaffe, A. Bodansky
- VIII. Studies on the relation of the pituitary to water metabolism, M. A. Goldzieher, J. Kaldor, introduced by L. Rosenthal
- IX. Observations on psittacosis in mammals, T. M. Rivers, G. P. Berry (introduced by Peyton Rous)

PEYTON ROUS, President

A. J. GOLDFORB, Secretary

DEATHS OF FELLOWS OF THE ACADEMY

JAMES BRENTANO CLEMENS, M.D., 10 East 71 Street, New York City; graduated in medicine from the University of Pennsylvania, Philadelphia, in 1883; elected a Fellow of the Academy April 4, 1901; died, May 5, 1930. Dr. Clemens was a Fellow of the American College of Surgeons and a member of the County and State Medical Societies. He was formerly executive surgeon of the Manhattan Eye, Ear, Nose and Throat Hospital and an Assistant Professor of Otology at Post Graduate Hospital.

EDGAR HORACE FARR, M.D., 57 West 57 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1896; elected a Fellow of the Academy February 1, 1912; died, June 2, 1930. Dr. Farr was a Fellow of the American Medical Association, a member of the County and State Medical Societies and Assistant Surgeon to Manhattan Eye, Ear and Throat Hospital.

WOLFF FREUDENTHAL, M.D., 24 West 88 Street, New York City; graduated in medicine from the University of Freiburg, Baden, Germany, in 1884; elected a Fellow of the Academy April 4, 1889; died, May 5, 1930. Dr. Freudenthal was a Fellow of the American Medical Association, the County and State Medical Societies, the American Laryngological, Rhinological and Otological Societies, the American Academy of Ophthalmology and Otolaryngology and the American Bronchoscopic Society. He was Laryngologist and Otologist to Montefiore Hospital and Bedford Sanatorium and Consulting Laryngologist and Otologist to St. Mark's Hospital.

EUGENE FULLER, M.D., 1642 Federal Avenue, Seattle, Washington; graduated in medicine from the Harvard Medical School, Boston, Massachusetts, in 1884; elected a Fellow of the Academy November 7, 1889; died, June 4, 1930. Dr. Fuller was formerly Professor of Genito-Urinary Surgery at the New York Post-Graduate Medical School.

FLAVIUS PACKER, M.D., 120 East 29 Street, New York City; graduated in medicine from the Albany Medical College, Albany, in 1893; elected a Fellow of the Academy November 6, 1913; died, May 2, 1930. Dr. Packer was a member of the County and State Medical Societies, the American Psychiatric Society and the Society of Alumni of Bellevue Hospital. Soon after his graduation from medical college he became assistant superintendent of Kings Park State Hospital and later of the State Hospital for the Criminal Insane at Matteawan, N. Y., and then became head of the Psychopathic division of Bellevue Hospital.

JASON SAMUEL PARKER, M.D., White Plains, N. Y.; graduated in medicine from Cornell University Medical School, in 1902; elected a Fellow of the Academy March 17, 1921; died, May 24, 1930. Dr. Parker was a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Alumni of Post-Graduate Hospital, New York, Surgeon to the White Plains Hospital and Assistant Surgeon and Director of the Fracture Service to Grasslands Hospital, Valhalla.

EDWARD LASSELL PARTRIDGE, M.D., 19 West 54 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1875; elected a Fellow of the Academy May 2, 1878; died, May 3, 1930. Dr. Partridge was a member of the County and State Medical Societies, the Alumni Association of New York Hospital, the Society of Alumni of Sloane Hospital and Alumni Association of City Hospital and Consulting Physician to New York Hospital.

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PSYCHIATRY'S PART IN PREVENTIVE MEDICINE

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Delivered February 21, 1930, in the Friday Afternoon Lecture Series of The New York Academy of Medicine.

The past two decades have seen much progress in preventive medicine, and during the last decade the whole trend of medicine has been in the direction of better prophylaxis. During the first of these decades psychiatry, handicapped by its traditions and by lack of lay and medical understanding, and burdened by the excessive numbers of mentally ill to care for, was unable to do much, except to provide increasingly good custodial care to the sufferers coming within its province.

With the advent of the Wassermann and the treatment of general paresis with the arsenicals, and with the more general employment of lumbar puncture, psychiatry learned that no case of syphilis could be considered permanently immune from neuro-syphilis unless repeated negative blood Wassermans were obtained following intensive intravenous therapy, and more especially unless it was determined over a period of at least two years following infection that the cerebral spinal fluid was not invaded. This was the beginning of a preventive effort regarding general paresis, and, while sufficient statistical study has not yet been completed, there seems to be evidence to show that in some mental hospitals the cases of general paresis have in ten years been reduced from 10

to 12 per cent of all admissions to 8 to 1 per cent. I will not attempt to analyze this decreased percentage of G.P.'s, but believe it is in part due to the employment of preventive steps insisted upon by the syphilologist and psychiatrist.

At the time of the Great War psychiatry began to come into its own and to develop into a vital force for prevention. The country was aroused from its self-complacent attitude by finding many thousands of our youth unfit for military duty by reason of mental defect, or of nervous or mental disease. In the years since the war we have seen nearly every State improve their facilities for the segregation of some of the feeble-minded and for the community treatment of others. This is a step that in another generation should lessen the propagation of the mental defective, but in this particular direction we still have a long way to go and much to learn regarding prevention. The misnomer "Shell Shock" brought to the attention of laymen and physician alike many cases of psychoneuroses that would otherwise have gone without understanding or treatment, and so we have recognized and cured many minor psychoses, as they have been called by some writers, and thus tended to reduce the number of nervous invalids in the community.

In the study of personality types we have come to recognize the schizoid and the syntonic, and thus we are better enabled in some cases to avoid the particular situations in life that would tend to push these individuals on into frank psychoses.

Yet you may say, "What evidence is there that psychiatry has done anything in preventive medicine when the total numbers admitted to mental hospitals are yearly increasing?" but so are the stress and strain of modern life, and so are the number of mentally sick persons admitted to hospitals who formerly roamed the streets or were secluded by the families at home. There are more general hospital beds filled with patients than there were

ten years ago, but that does not mean that more people are annually sick, for we know typhoid fever, tuberculosis, diphtheria and many other diseases are much decreased to-day. It may take another quarter of a century before we can definitely demonstrate results in the prevention of mental disease, but that psychiatry is even to-day beginning to play an active part in preventive medicine I believe few can deny.

One of the preventive forces borrowed by the psychiatrists from the medical clinic, and developed to a very high degree, is the psychiatric social worker who investigates the social environment of our cases; who helps in the adjustment of the environmental situation when it is indicated as a measure of treatment, and who especially follows up cases leaving a mental hospital for a very long period of time. The assistance of the psychiatric social worker has been very great and serves as an indispensable part of the psychiatrist's armamentarium in his preventive measures. The psychiatric social worker has a recognized place in every well-organized mental hospital, out-patient department and child guidance clinic.

To-day every psychopathic hospital, and many of our State and private mental hospitals, have out-patient departments where large numbers of the psychoneuroses and psychoses are treated. Here the psychiatrist, the psychologist and the psychiatric social worker examine, investigate and carry on the treatment of psychoneurotics and of incipient psychoses, such as mild depressions, hypomanic states, early schizophrenia, general paresis and other types of cases in which institutional treatment is not indicated; and thus many psychotic cases are readjusted or stabilized sufficiently so that they never need to go into a mental hospital.

More and more the work of the mental hospital lies in the field of prevention and undoubtedly can best be met by the development of out-patient facilities. And in the mental hygiene movement as a whole and perhaps more

especially in the mental health program of individual states, no better policy could be established than that for each dollar spent for building an equal amount be devoted to prevention.

The best organized evidence of the attack on nervous and mental disease is in the schools of our country, and especially in the Child Guidance Clinics. At least fifteen large cities of this country have well organized Child Guidance Clinics where the pre-school and school child is thoroughly examined and treated by the psychiatrist, the psychologist and the psychiatric social worker. Most of the school systems of our cities, and many towns, have made provision for psychiatric examination of problem children. In Massachusetts there is a State law that requires the examination of all school children three years or more retarded; this is carried out by the staff physicians of the State hospitals. We know that 75,000 new cases are being admitted to mental hospitals each year; at the present admission rate that means 750,000 in the next ten years. From our knowledge of the average age of these patients on admission we know that the majority of these prospective mentally sick are in our Grammar Schools and High Schools. The school psychiatrist is certainly in a strategic position to do preventive work, for we know definitely that certain mal-adjustments of personality not recognized or improperly treated mean a later psychosis, and that these cases can in many instances be so directed that nervous invalidism or the frank psychosis is avoided.

Perhaps one of the greatest contributions made by psychiatry to preventive medicine is the insistence upon the understanding of the patient as a total human being with emotions as well as tonsils, with conflicts as well as a heart, and with thwarted purposes as well as a gastrointestinal tract, so that we do not diagnose heart disease without understanding the total personality of the patient whose heart interests us, or do not take out the patient's tonsils to cure a psychic conflict. An illustrative case

may make clear the point I wish to emphasize: A man of 32 came under my care because he had become afraid to leave his house unaccompanied or to be left alone in his home. For two years he had made his rounds of medical men with the result that the following diagnoses had been attached to him: deviated nasal septum, eye-strain, gastroptosis, mucous colitis, varicocele and floating kidney. Is it any wonder he was afraid to be left alone? All of these conditions may have presented themselves to the examiners at various times, but a series of diets, belts, irrigations and operations could only have exaggerated his condition until the primary difficulty, which was a definite mental conflict, was understood and removed by treatment. I may have used an extreme case for illustration, but there are far too many nervous invalids being created to-day because the medical man fails to investigate mind as well as body, and then to evaluate the disorders that may be present in both fields. You may say, "But the psychiatrist thinks all disease is located in the mind;" not at all; the well-staffed psychiatric clinic finds that a large percentage of mental defect has its basis in birth injuries, deafness, visual disorders and endocrine dysfunction. The psychiatrist knows that certain neurasthenic and hysterical symptoms may be the earliest manifestations of a brain tumor. Focal infections are not neglected; in fact, perhaps some of us have over-emphasized their importance. In a high percentage of all our cases we find causative factors in the blood picture, in the gastro-intestinal tract, in the gall bladder and in impaired kidney function. I shall never forget a delirious patient sent from the medical wards of a general hospital to a psychiatric hospital for care. A few days later the mental hospital made a diagnosis of central pneumonia, whereupon the referring physician at once said, "Of course, you will send the patient to us for treatment of his pneumonia!" When it was explained that the physical disease would receive adequate treatment, and the mental symptoms better treatment than the general hospital could provide, the medical man expressed surprise, but the patient soon recovered in our

mental hospital; and I honestly believe that many delirious patients die in the general hospital who would recover in the mental hospital, because of better understanding of the treatment of delirious states on the part of the psychiatric nurse and doctor. Recently, in one of our New England mental hospitals a case of undulant fever was diagnosed by a staff physician, this being the first case recognized in the whole State, so that the mental hospital cannot be accused of being medically unobservant or unprepared.

The psychiatrist to-day has a recognized place in the medical departments of schools, colleges and industry, in which fields the work is largely preventive.

It seems to me that psychiatry still has a very great contribution to make to preventive medicine in the field of a better understanding of the causation of some of the recognized mental diseases which, at the present time, fill a large proportion of our mental hospital beds. Since the days of Kraepelin's classification, which began more than a quarter of a century ago and which has been modified and improved, but not essentially changed, there have been, with the exception of the treatment of general paresis, the more careful correlation between physical and mental findings and the analytical approach to some of our cases, almost no real contributions to the understanding of the etiology of the psychoses, and it is high time that every psychiatric hospital with its wealth of controlled material should establish laboratories for an intensive attack on such important mental diseases as schizophrenia and the manic-depressive psychoses. Until this is done we will, I am afraid, have to concentrate our attack on mental diseases largely upon our attempts to adjust personality at earlier age levels, and to individualize and intensify our treatment of cases. A great number of research workers concentrating with all modern methods upon the study of a large group of psychoses whose etiology is at the present time unknown, may, in the next quarter of a century, bring to medicine a better under-

standing of the essential factors underlying thousands of mental cases, which would enable medicine to reach intelligently a large percentage of cases to-day occupying hospital beds. However, let me call to your attention the fact that a tendency which has existed for a good many years past to describe and classify mental disease has, more recently, given way to our attempts to understand the individual biologically as well as psychologically, to investigate thoroughly and to evaluate the mental maladjustment from that viewpoint. And the more we have done this the more we have come to realize that many cases we tended to classify as schizophrenia were reaction types rather than disease entities; and also with the manic-depressive group, we have learned that many individuals have one period of depression, and at times a manic episode, without adequate justification for giving them a definite classification, and that this broader approach to the underlying problems has enabled us to readjust many cases rather than simply to classify them, and, undoubtedly, our intensive research just referred to will be more productive when directed toward those psychotic individuals whose disease process develops and tends to become fixed in spite of our many attempts to study and readjust without the use of the microscope and chemical laboratory.

Let me close with an illustrative case from my college mental hygiene experience: A freshman in college became depressed, unable to sleep and unable to study. He was sent to the Health Department, where it was found that he had no physical disease. His father had for years suffered from a manic-depressive psychosis, and the boy had always feared he might become a victim of the same disorder, so, quite naturally, when he became fatigued with hard study and working additional hours to earn money, he could not concentrate, his grades fell and he became depressed. When he saw the psychiatrist he was convinced that his father's future was before him. A readjustment of his working hours, better diet and general

physical hygiene, together with explanation and encouragement, soon dispelled the depression; the boy got well and finished his year with high marks. In his second year, emotional over-stimulation of fraternity activity and competition for a position on a college publication brought on an attack of acute excitement that was recognized as a manic attack. Immediate rest in bed with mild sedatives promptly cleared this up, but it was felt that two mental upsets in two years made the situation serious. He was advised to go into the country for six months, which he did, and then advised to transfer from a large city college to a small college in a country town. Here, competition of all sorts was less, reducing mental stress and strain, and he was graduated two years ago. He is now holding a good position (again without too much stress and strain), has had no recurrence of his trouble, and I will venture to predict will not, if he obeys the rules of mental health that apply to his make-up. Without mental hygiene I am sure our mental hospitals would have added another to their list of cases; and so I believe that psychiatry is already contributing something to preventive medicine, and will have much more to contribute, if medical education trains all physicians to understand and treat the whole human being and not simply a diseased section of a case, and if psychiatry itself develops a group of physicians intensively laboring to better understand the causes of the mind diseased, not only at the bedside but also in the laboratory.

JOHN OF ARDERNE,
MEDIEVAL ENGLISH SURGEON.*

FRANK S. MATHEWS

Our knowledge of the practice of medicine in early England is sufficiently scant to warrant our taking an interest in the story of John of Arderne, the first English surgeon of whom we have definite information. He gives us more than a peep into the life of the surgeon of his day, describes his manner of working, gives particulars of his financial arrangements with his patients, and lays down his ethical standards. We learn from his writings how much medical knowledge that is to be found in the writings of Hippocrates had been forgotten in the dark ages. In this regard the condition is not unlike the development of the English stage which sprang up uninfluenced by the comedy and tragedy of the Grecian stage.

It is an interesting bit of information that he is the source of our knowledge regarding the ostrich feather worn above the crest of the Princes of Wales, for he says that Edward, the eldest son of Edward, King of England, wore a similar feather above his crest and he obtained the feather from the blind King John, of Bohemia, whom he killed at Crecy in France. "And so he took the feather which is called an ostrich feather which that most noble Lord King had used hitherto to bear above his crest." Our information regarding John of Arderne is almost exclusively derived from his own writings. These were written in Latin and must have become very popular for a considerable number of them were shortly translated into English. They are preserved in larger or smaller installments in a number of libraries throughout the United Kingdom and there is one important manuscript which is preserved in Sweden.

The easiest way to think of John historically is to think of him as a contemporary of Chaucer, who died in the year

* Read before the Section of Historical and Cultural Medicine of The New York Academy of Medicine, March 12, 1930.

1400. Arderne was born in 1307 and lived till well on toward the end of the century. Both Geoffrey and John have surnames, which names had only recently been adopted in England following the custom of the Norman French. So John is of Arderne, or Ardern or simply John Ardern. He regularly speaks of himself as "Magister Johannes de Arderne" which distinguishes him as a master surgeon from the barber surgeons of his day. "And be it known to present and future generations that I, Master John of Arderne, the least of the surgeons, scribbled this book with my own hand in London in the year, viz., the first year of the reign of Richard II and in the seventieth year of my age." This sentence fixes the date of his birth as of the year 1307; shows that he was an educated man for he could write, and moreover in Latin; and shows that his treatises were written after he was seventy years of age when he could draw on his personal experience for much of what he had set down and could even give the final results in some of his cases. He does not hesitate, however, to intersperse references and quotations from books and authors with which he was familiar. He traveled extensively and probably practiced abroad, very likely only as a military surgeon. He mentions the Flemish equivalent for the names of a number of his herbs, which suggests a familiarity with the low countries. He must have followed a military expedition through northern France and also relates how he treated a case of suddenly developing wry mouth at Algiers in Spain. His most celebrated treatise was "On the Fistula in the Fundament," which he wrote "with mine own hand in the year when the strong and warlike Lord [Edward the Black Prince] was taken to God." His early practice in England was in Newark where he was living at the time of the first great epidemic of the black plague in 1348 and 1349. This terrible scourge seems to have made surprisingly little impression upon him for his treatises do not mention it; but this may be partially explained by the fact that they covered a different type of subjects and that they were not written until twenty-five years later. He was certainly living as late as 1377 but how much later

we do not know. Sir D'Arcy Powers, to whose editions of John's works with his very careful editing and abundant notes I owe all my knowledge of this English surgeon has this to say of him: "He is a good example of a type of surgeon who has happily never been absent from England, the distinguishing mark being an English gentleman as well as a fine surgeon of good education, wide experience and sound judgment. John Arderne possessed these qualities in abundance."

His medical practice seems to have been about what we would expect from one of his time but surgically he was in advance of it. In his surgical treatises he speaks with an assurance based on experience and quotes special cases in evidence often giving the names of the patients; and he is fond of calling attention to the worth of experience as compared to resort to authority for, says he, "the surgeon must be of subtle wit, for all things that belongeth to surgery may not with letters be written."

And so we may think of this medieval English surgeon as a contemporary of Chaucer, using his type of English and surrounded by an atmosphere of feudalism and chivalry, operating on its knights and nobles as well as on the more prominent clergy, with headquarters at Newark, removing thence to London there to practice and write his treatises after he was sixty years of age.

It is convenient to divide our John into two Johns: first, the physician, and second, the surgeon. A reading of his treatises will show that this is not at all an arbitrary classification.

As a physician he was not better than his time. He was unscientific, not an experimenter, nor does he show critical judgment. He puts down for use anything which he has heard recommended. Complicated mixtures rather than single drugs appeal to him. He uses ant's eggs, earth-worms beaten with white wine, powdered cow's horn in rain water as well as all kinds of herbs the names of which have ceased to be familiar to us. These herbs he collected

himself and he tells us where they are to be found growing and just when and how they are to be gathered. John Falstaff tells of the smell "of Bucklersberry in simpletime" referring to the drug market in London but there was no drug market in Arderne's day to which the physician could resort when he needed a new supply of simples. We need not be too critical when we hear of "Essence of unperforated pearls" and of "Dragon's blood mixed with galls of oak bark and plantain seeds" nor are we to think of ourselves as conspicuously superior in critical judgment to John of Arderne. How many professors of medicine are to-day dispensing mixtures of endocrines to be taken by mouth, most of them not known to have any pharmacological effect when so administered. John, at least, knew something of the composition of his own messes for he concocted them himself, while we often know the manufacturer's name of our mixtures but not their composition. It was not till two hundred years later that Ambrose Paré first questioned the efficacy of unicorn horn and powdered mummy administered internally for the relief of sprains. Paré did not convince his confreres, many of whom looked down upon him as half educated, and one said that though he was a fairly good practical surgeon yet he was too ignorant to decline his own name.

John was not disposed to take too many chances and so did not depend on drugs alone. He says a good prayer to be said is: "Oh God, who hath wonderfully created mankind, and more wonderfully reformed him; who hath given medicines to govern the health of men's bodies; of thy great goodness look down from Heaven and give thy blessing to this antidote, electuary or potion, and so forth, that the bodies of those whom it shall enter may be worthy to receive health of mind and body through Christ, our Lord, Amen." This pious prayer in no way interferes with his employment of charms in which he had equal confidence. He is well versed in astrological knowledge and gives detailed information as to whether one should or should not operate or collect herbs during certain phases of the moon or when certain constellations are in the as-

endant. Careful directions are given on the manner of compounding his draughts and ointments. He is likely to say when the ingredients are put together that they are to be "meddled" with a spatula during the space of one Ave Maria and a Pater Noster. Remember that they had no stop watches in his day. A certain Canon of his time who treated chronic rheumatism with an oil said it was to be put into a clean vessel and put to the fire while one made the sign of the cross and should say the Lord's Prayer, an Ave Maria and repeat the psalm, "Why do the heathen rage" till one come to the verse "Desire of me and I shall give thee the heathen for thy inheritance." These physicians evidently had in mind this method of fairly accurately measuring time as well as some belief in the mystical usefulness of the words employed.

John's medicine was of little real value compared to his surgery; yet his medical fame only comparatively recently departed for some of his prescriptions for ointments were in the early British pharmacopeias, in one of which is mentioned, "a most noble ointment," "but it seems the present practice hath not faith enough to rely upon it for anything, for neither this nor the foregoing are ever prescribed or made. However it hath been thought fit to continue such extraordinary discoveries still upon record for the sake of any that may think proper to make trial of them."

The most interesting part of our knowledge of John as a surgeon comes from his most celebrated treatise on "Fistula in Ano." The methods of treating fistula by means of cutting instruments and also by setons were both known to Hippocrates. He inserted a tin probe into the fistula and brought it out through the anus and with this as a guide drew four or five setons wrapped with horsehair through the fistula. When the ends had been tightly tied "the patient was told to go about his matters." In the early Christian centuries there is abundant evidence of mental backsliding in matters medical as well as in other departments of knowledge. Curiously these methods of

treating fistula were largely forgotten and other rather heroic methods of treatment replaced them at least in Medieval England. In the beginning of his treatise Arderne says, "And this I sey, that I know not in al my tyme, ne hard in al my tyme. of any man nouthur in yngland ne in parties biyond ye see that kouthe cure fistula in ano."

His first patient was Sire Adam Everyngham "who made for to aske counsel at all the leeches and cirurgienz, that he mygt fynde in Gascone at Burdeux and many other places and all forsoke hym for uncurable whiche y-se and y-herde the forseid Adam hastied for to torne hom to his contre. And when he com hom he did of al his knyghtly clothinges and cladde mornyng clothes in purpose of abyding dissoluyng or lesyng of his body beyng niz to him. At last I, forseid John Arderne, y-sought and couenant y-made, come to hym and did my cure to hym and, oure lord beyng mene*, I helid hym perfytely within half a yere and aftirward hole and sounde he ledde a glad lif by thirty yere and more ffor whiche cure I gatte myche honour and louyng thurz al yngland. And many gentils wonderd thereof."

He tells us of a number of patients whom he cured of fistulas while he lived at Newark between the time of the great plague and his moving to London in 1370. He had many bad cases among them Thomas Browne who applied for treatment suffering from fifteen discharging sinuses "of which some holez was distant from the towell by the space of the handbrede of a man," and many others of which the "tellyng war ful hard." And he says that our blessed Lord Jesus knows that he lies not, that of all famous men all have confessed them that they found not a way of correcting these cases; for God, that is the rewarder of wisdom, hath hid many things from wise men and sly which he vouchsafed afterwards to show to simple men.

He knows of one man who claims to have cured fistulae and he knows that his claim was false and that there is no

* Domino mediante.

other man either in England or in the parts beyond the sea that could cure a fistula in ano.

John's manner of curing a fistula showed considerable ingenuity, and I doubt not that a surgeon of our day would have equal difficulty in curing a case if he were compelled to operate without assistance and without anaesthetic. His instruments include a probe which he calls 'sequere me'; then he has a 'snouted needle'; and a syringe, very primitive in type, the tube of which he says was made of tree, of box or of willow and it had a flange at one end. To this was attached a swine's bladder which was tightly tied over the flange of the aforesaid portion of tree. He gives directions for preparing the bladder and before it is applied to the tube it is filled with the fluid or ointment to be injected. An important part of his outfit is a strong thread, which he calls the 'Fraenum Caesaris.' This was always passed through the fistula with the help of the snouted needle. He had an instrument called the tendiculum made partly of wood and partly of metal. The point of this instrument was inserted in the outer opening of the fistula and was held in place by an assistant. In this instrument, thus constituting a fixed point, there was a wooden key exactly like one of a violin and around this were attached the ends of the strong cord just mentioned. When the key was turned the cord was tightened, drawing outward all the tissue to be divided. A small spoon-like instrument was inserted into the rectum to protect the side opposite the fistula from being damaged when the tissue to be divided was suddenly cut by the sharp lancet. The instant the division was complete, out dropped from the fistulous tract the whole armamentarium, tendiculum, cord, protecting spoon and lancet.

He was apparently not always able to do a complete operation at one sitting and presumably left the seton in place between his attacks on the fistula. Presumably also, when the internal opening was high and the amount of tissue to be divided large and hemorrhage to be feared, preliminary treatment with the seton was resorted to. His

treatment departs from the usual treatment of his own time, which consisted in attempting to destroy diseased tissue with caustic mixtures. His understanding of the origin of a fistula in a previous abscess and his knowledge of the necessary division of the principal tract, ending usually in a single internal opening, differs very little from our own conception of the pathology and treatment. Instead of irritating and complex potions, which characterized his medical treatment, we find him resorting only to simple and soothing applications, such as oil of roses, the whites or yolks of eggs applied on linen.

He first controlled bleeding by pressure only and at later dressings used simple astringents. He thinks it highly important that one should make careful selection of his cases so that he might not undertake a case that was not likely to be brought to a successful termination. In the Middle Ages the practise of surgery might be considered an extra hazardous occupation for there was no limit to the penalty that might be imposed on the surgeon whose remedial attempts were unsuccessful. The blind John of Bohemia, for instance, having found a surgeon who thought he could cure his blindness and who failed, had the said surgeon sewed in a sack and dropped from a bridge into the river. John believed many cases to be 'uncurable' and directs that one should especially avoid those that are 'fainte of herte.' During the treatment, one of his patients swooned, "and witte thou that never I saw man under my hand suffre swoynying, outtake him this." The swooning patient can hardly be blamed when we learn from reading farther that not only the main tract, but half a dozen secondary tracts, were divided at one sitting.

In his surgery he is making constant use of trained observation and thus was able to notice both symptoms and pathological changes resulting from varying methods of treatment, but how could his medical practice be any better when he was entirely ignorant of the functions of organs, and when the world must wait another two hundred years for his countryman, Harvey, to demonstrate the circulation of the blood.

He has much to say regarding the conduct of a surgeon. He is to be dressed as a clerk when he goes into rich men's houses, that he be not taken for a servant. He should treat some poor men "that they by their prayers may get him grace of the Holy Ghost." Those who have considered his fees, however, and have taken into consideration the different buying power of the money of his day, say that they were very high, and he insists that they should be when the patients are wealthy. Also that taking the money in advance is not without its good points; at any rate "make he covenant for his work" in advance of undertaking it. Ask he competently from a worthy man and great forty pounds, and never take less than one hundred shillings, for "never in all my life took I less than an hundred shillings for the cure of that sickness netherlesse do another man as hym think better and more spedefulle." One sees here some evidence of a sliding scale of charges based upon what the traffic will stand. The surgeon is not to be given to too much laughing or playing and he is to "fellowship not with knaves," and "be he evermore occupied with things beholding to his craft." "Moreover rede he or studie he or write or pray he." "Be he evermore sober, for drunkenness destroyeth virtue and bringeth it to nought." The surgeon should not think too much of his personal comfort for, says he, in strange places let him be content with the meat and drink there found, using measure in all things. When he goes into strange men's houses to operate on them "consider he not overopenly the lady or the daughters or other fair women in great men's houses, nor profer them not to kiss, nor touch not openly or privately their hands nor breasts that he run not into the indignation of the lord nor none of his." Sir D'Arcy Power seems to think that the above statement requires explanatory note and says "The greeting of ladies by thrusting the hands into their bosom had a long vogue in England, and it would be interesting to know whether the fashion of wearing low-necked dresses was a cause or an effect of the custom. By the end of the seventeenth century it was only used by near relatives, and Mr. Samuel Pepys records that he availed



WILLIAM HENRY WELCH
(REPRODUCED FROM AN ETCHING BY ALFRED HUTTY)

REPORT OF DINNER GIVEN IN HONOR OF
DR. WILLIAM H. WELCH AT THE NEW
YORK ACADEMY OF MEDICINE ON
APRIL 4, 1930

DR. SAMUEL W. LAMBERT (Toastmaster)

Dr. Welch and Fellows of the Academy, it is with great regret that Dr. Hartwell, our President, cannot be here to-night. He is laid up with a slight indisposition and not allowed to go out so it has fallen to me to attempt to take his place. We are here for the purpose of talking to Dr. Welch and having him talk to us.

My first experience with Dr. Welch was back in 1882. At that time the medical schools of this city were sick. They were drying up. The inheritance from French education was being forgotten and neglected. The teaching methods of Germany had not yet been brought here and put into active use. While the schools were giving nothing but a degree and taking from their students income for the professors and others, the true education and true teaching in this city was being done by young graduates of three and five years standing organized in what were known as quizzes. A little group of quiz masters lived in the streets about Gramercy Park and Madison Square—Dennis, Hall, Halsted, Hartley and F. Marcou were young unknown surgeons. McBride and West Roosevelt and Thacher were young medical men and Welch was one of that same group. Alphabetically he may have been the last, but he was far from the least as you know. He had recently been appointed pathologist to the Bellevue school. He was already recognized as a leader and looked upon as a New Yorker with a great future ahead of him and New York in 1884 was shocked to learn that he had accepted a call to Baltimore to become the professor of pathology in the new school being established there. Dr. Welch therefore started as a New Yorker and has been a member of this Academy for many years. He is now one of our honored and Honorary Fellows. From that beginning he has

grown to be a citizen of the world. That he resides in Baltimore is only an incident.

There are many phases of this man whom we are here to welcome and to honor. One of the important ones for which he has been known is that of scientific investigator. There is here a colleague of his, a co-worker in many activities, and I take pleasure in introducing Dr. Theobald Smith who will tell us about Dr. Welch as the scientific investigator.

REMARKS MADE BY DR. THEOBALD SMITH

Mr. Chairman, may I be permitted to read a letter which came to me this morning in the mail from the previous Dean of the Department of Pathology of Magdalene College, Cambridge:

"I think it probable that you will attend the celebration of the eightieth birthday of our very dear friend and colleague, Professor W. H. Welch. I write to ask you as the other honorary member of the Pathological Society of Great Britain and Ireland resident in the United States to represent our Society at Washington and to convey to Welch the best wishes and congratulations of the Society."

Since receiving the invitation to speak this evening, I have been wondering why I was chosen. I knew there were a great many others who were far more fitted to speak on this subject. I was also asked to be informal and reminiscent. But can you do it? It is a subject of the greatest importance to talk about Dr. Welch as a scientific investigator.

Now unfortunately my contacts with Dr. Welch have not been very extensive. I was never a student of his nor a research worker under him, but I did come in contact with him in some very pleasant ways. Early in my career, I used to go from Washington to Baltimore and talk over with Dr. Welch a great many of the personal physical and scientific troubles that bother a beginner in the study of

bacteriology and pathology. I think that was in 1886 and 1887. That was before there were any other workers, when he had the whole world before him and was really in the midst of researches. It was unfortunate that his time was so much taken up by almost everybody else that there was so little time left him for research. I am not familiar with Dr. Welch's work before that period. That work was more or less in experimental pathology dealing with such subjects as thrombosis, edema, etc.

This was the time when the younger men were drawn into that maelstrom of bacteriology which was formed by the significant discoveries of Koch and his school. Many of you bear in mind that the monograph referring to the tubercle bacillus was published in 1884. Then followed the typhoid bacillus, the diphtheria bacillus and cholera and a number of other important discoveries and we were drawn into that current and Dr. Welch was drawn into it also.

I have read every word of what he published during that time and I know of no publications which surpass his, in lucidity of style, accuracy of expression and thoroughness of work and that great judiciousness in which both sides are taken into consideration and the balance drawn.

I also remember Dr. Welch in the early meetings of the Association of American Physicians. He was the one who carried the burden of the discussion. And when the discussion flagged, with some new thought he would come to the rescue and would tell us something new about the paper. If he had any criticisms to make, he did not make them directly, but took the side of the one who read the paper, showed all the good qualities of that paper, and gradually came around to the point he had in mind and of course the reader didn't know he had been opposed or answered, it was done so gently and successfully.

Now it is said of Buddha that after he had learned all that he was to learn he went into retirement and considered whether to give the world his knowledge or keep

it to himself. I know from my own contact with Dr. Welch that he made up his mind to give his wisdom to the world and that anyone who came to see him for advice in regard to the researches which he was conducting got the best that Dr. Welch had to offer at the time. I think that I may say that probably not one fourth of Dr. Welch's real researches have been published. I imagine they were hung up by such things as I have mentioned—by his desire to help everyone that came to him and not only that but his desire to see that the new medicine was going to reach the hearers that should be reached. For if you look over his works, you will see that he has gone to a great effort to write those monographs on the early work of bacteriology. They were models of style and it would be worth your while for you to read them again if you can get the time. The problems are very much the same to-day as they were at that time.

Now I think it would be very nice if we did not consider an occasion like this as in memory of his eightieth birthday because I don't think it very nice to punctuate the years (I have just had my seventieth birthday), but to consider this one of those cyclic explosions of enthusiasm which have been aroused around Dr. Welch ever since the anniversary of his twenty-fifth doctorate. That was rather quiet, but accompanied by a large volume of researches from his pupils and if you look them over to-day you find they are very remarkable researches. To-day they would be put into some current journal, but I doubt whether any one journal could contain the great volume of work. If we consider him a research man, we must look to his pupils for he is giving out all the time. He did work by proxy among hundreds of men and it is the fruit of that work which is of such incalculable value to the century and which has directly forged the new medicine ahead and built it into material structures all over our country.

It is not uncommon for speakers to have a superiority complex in speaking about a younger man than they are. I cannot have that superiority complex to-night because

Dr. Welch is not only eighty years old but a fellow professor in a new department of knowledge. I doubt whether that has ever been reproduced in medical or in other history to-day and it is so fortunate that he should go into research in this new department because it is of the greatest importance that medicine should realize its history. Medicine to-day is very much like the tower of Babel. It is stated in Genesis, "The Lord said, We shall go down and confuse their language so that they shall not understand one another." That is about the condition of medicine to-day. We are all so wrapped up in our technical jargon and cannot understand one another. We are fortunate to have someone who has learned medicine to take up the subject of medical history and push it along as he has the subject of medicine.

In looking over some histories not long ago, I was surprised that not a word was mentioned of disease. You can't find it in any history. You find wars, battles, victories, and things of that sort but when you think of it, disease is the warp woven into the whole life of humanity. When you read a little of Pendennis and think how it darkened the world you can realize what an influence disease must have had on human life. Now it is fortunate that we have Dr. Welch in the Chair of Medical History and we hope that he will keep on with it and in the next five years we will have another eruption at the New York Academy of Medicine and another in ten years perhaps and I trust that we shall all be here to see it.

DR. LAMBERT: It is a rare occasion to catch a man and make him sit still while his friends tell him what they think of him and what they know of him and I take great pleasure in introducing a specialist on this subject, Dr. Camac, who will speak of Dr. Welch as a student.

REMARKS MADE BY DR. C. N. B. CAMAC

Mr. Toastmaster and Fellow Guests: I shall speak of myself as a student, not Dr. Welch.

Were Dr. Welch a British subject I have no doubt that we would be addressing him as *Lord Baltimore*. Titles of this nature being contrary to the customs of America, I address him by that affectionate sobriquet which I have reason to believe he cherishes as highly as his many honorary degrees: *Popsey*.

Oliver Wendell Holmes, at the conclusion of his "Over the Tea Cups," refers to the many intrusions upon his privacy, both directly and through the mail. The world had come to feel that he belonged to them. It is in such a position that Dr. Welch has been for some years and it is rumored that when he wishes to be assured of privacy he resorts to his bath, but that even there messages are shouted to him over the transom.

Dr. Williams has invited me to speak of the student's viewpoint regarding the early years at Hopkins.

The group of students to which I belong, were not graduates of the institution in the academic sense. The Hospital was opened in 1889, and interns were needed. Four years later the Medical School was opened, and Instructors and Demonstrators were required. Graduates of other Schools went to Baltimore to serve in these capacities, till sons and *daughters* should have been produced from the loins of the parent University. Many remained long after this event, but, it is typical of the Hopkins spirit, that we adopted sons, whether we remained or went to other fields, were remembered through the subsequent years, with the same interest, as were those graduates who had measured up to Dr. Welch's searching requirements for admission.

We were fortunate to get in by the side door, for Dr. Welch had stated that, by the main entrance "the requirements for admission were not surpassed in any Medical School in the World." We more than understood Dr. Osler's remark to Dr. Welch "we are lucky to get in as Professors" for, he added "I am sure neither you nor I could get in as students."

Our group came from the States and Canada. Some of

these men were faculty timber from the first. Councilman for example. He seemed to us, to have been dug out of the foundations, for Dr. Welch on his arrival at Baltimore, found Councilman, his tricycle nearby, at work in the pathological building, before the structure was completed.

The other men from the States were Thayer, Finney, Flexner, Abbott, Cushing, Bloodgood, Carter, Livingood, Blumer—I cannot name them all; from Canada there were Lafleur, Barker, McCrae, Fitcher, to mention a few only. When some one commented to Dr. Osler upon the efficiency of the men from Canada, he replied: "Oh yes, but the best *remain* in Canada."

We had come from old institutions, which were trammelled with tradition and dead wood and, there was the obsession that the success of a Medical School was to be gauged by *Quantity*. Yearly reports boasted of the size of the classes and institutions vied with each other in efforts to attract students. We had been the victims of this mass education, in which the student saw the teacher from the benches of a crowded amphitheater only, or, in the quiz class, an evidence in itself, of the inadequacy of the system of medical education at that time. The size and number of buildings, were also criteria of success.

In contrast to all this, Dr. Billings, through articles and pamphlets, was advocating radical changes in the construction and administration of hospitals which were to be an integral part of Medical Schools. Dr. Welch, had outlined an ideal Medical School, which seemed Utopian, but which the benefactress of Hopkins, Miss Garrett, fortunately insisted should be adopted without any modification. Dr. Gilman, in his address at the opening of the University, had said, "The glory of the school rests upon the scholars and the teachers brought together and not upon their number, nor upon the buildings constructed for their use."

It was with such men and ideals. that this group of graduate students was called to labor and help build.

Twenty-five years later, Dr. Welch, referring to these be-

ginnings, said: "Our whole method of teaching was to a large extent a reaction, which may have seemed almost too sweeping, against methods previously existing," and then, going on to describe the method and the results, he says, "There is little didactic teaching. The whole atmosphere of the place has been practical teaching, both in laboratories and wards. All this however, relates to organization, and to providing opportunity for study. The real results are not there. They are to be sought in the life of the institution, in the men connected with it, and those who have gone out of it. It is seen also, in the spirit of harmony which prevails, in the concession of the right of each individual to develop, and, in the spirit of research. . . ."

In reminiscent mood, it is such thoughts that come to one who saw some of the workings of this fundamental reconstruction of Medical education in America, and, I believe it to be no exaggeration to say that the future historian will treat this "reaction against methods previously existing" in the same manner as a modern historian has recently treated the reaction of the famous Italian, French and English Scientific Societies of the 17th Century, to the didactic scholasticism of the Universities of the period.

Mr. Toastmaster, I should like to speak of the opportunity we had of seeing demonstrated, by master minds, the many discoveries in bacteriology, serology, hematology, etc., with which the end of the 19th Century was so rich. Some of these discoveries were made by our teachers and fellow workers and even by undergraduates. I will refer to that of the undergraduates only. McCallum and Opie, fourth year medical students, demonstrated their biological discovery in the malarial parasite (proteosoma) of the crow's blood, a discovery, the significance of which was immediately appreciated by biologists throughout the world. Here was indeed proof of the soundness of the new system of education. Didactic mass education had nothing to compare to this among its undergraduates. In this new system, the curriculum was so ordered, that the

undergraduate had not only time to think, but it was possible for him to engage in scientific research. Here, too, was a School for more than merely transmitting book learning; men were contributing to knowledge and what was more important, men were being developed. To repeat Dr. Welch's expression, there was "the concession of the right of each individual to develop," to which may be added Dr. Osler's dictum: "you can not get 30 horse power work of a 20 horse power motor, but you can change a 50 horse power man into one of a hundred or more. . . ." It was this latent power, that these masters were arousing to action, and which later they were to send out into American Medicine, with the far-reaching effects known to us all.

I should like to speak in detail of Dr. Welch's course in Pathology, but I will mention only the opportunity this course afforded us, of seeing the man horse power mutation in operation in the person of Dr. Flexner, who conducted many of Dr. Welch's classes. When we saw him purse his mouth and focus his keen eyes upon us, we knew that he was digging down into his resources and increasing his horse power; whatever Dr. Flexner's erga may have been originally, by the end of the course he was hitting on all eight cylinders and taking hills on high-tension. The subsequent history of this particular instance of man building is well known, but it must be remembered that these results were obtained with material which had not been carefully picked, by the Welch entrance requirements.

I leave it to you to estimate the credit due the Master Builders in this instance. Many of those who were graduate products of the Hopkins educational system in its entirety as well as those of the first group, are to be found to-day in the office of President or Professor in a large number of institutions, throughout the country.

In the training at Hopkins there was a something more than a high grade curriculum, and this *something* Dr. Welch has described as "an atmosphere, an environment, and ideals which will always be cherished and will con-

tinue to be an abiding influence." I will add that these were largely the result of that purpose of our teachers to make us discover every resource within us, and to the scrupulous attention, to the giving credit to him who did the work. Though the Hopkins system of education has been reproduced by old and new schools, this man building feature has not received the attention it so eminently deserves.

I should like to speak of the gatherings at the autopsies. Welch and Osler and a large group from the pathological department and the wards, in attendance with Flexner, Blumer or Livingood, performing the post mortem. A thorough necropsy with the taking of bacteriological and histological specimens was a novelty in those days. With the discussions and demonstrations at these gatherings, our education advanced by leagues.

I should like to refer to the Medical Society, over which Dr. Welch presided for many years and at which he always made remarks which sent us next day to the library with suggestions for reading. Quotations from French and especially German authors, were copious at these meetings and we soon learned the importance of a "reading knowledge" of these languages as required by Dr. Welch of the candidates for his ideal school.

I should like to speak of our playtime and relaxation—the luncheons and dinners to celebrities who visited the Hospital—to be invited to these was an event in our lives. Then there was the baseball team in which Harvey Cushing marked my finger for life with a hot liner to shortstop. Our gatherings at Hontzleman's for pretzels and beer after a longish day, and much more noisy parties that brought Dr. Hurd, the Superintendent, in speechless indignation upon us, individually or en masse, and which bowed down the saintly Sister Rachel, the Housekeeper, in sorrow at the way of youth.

Time does not allow of indulging further in these reminiscences, but Mr. Toastmaster, if you will permit me to

take a moment more, to ask Dr. Welch to accept a modest token?

This volume is presented, not because it has intrinsic value, but because it has belonged since 1776 to four generations of North American physicians; graduates of Edinburgh; Glasgow; Harvard; Columbia; and The University of Pennsylvania.

It is the work on Hygiene by Hippocrates, done into English in 1734 by Francis Clifton. It contains "The Life of Hippocrates" by Soranus of Ephesus; the portrait bust by Rubens, and "The Account of the Plague at Athens" by Thucydides.

It is a "Princeps" listed among the Prima in the Bibliotheca Osleriana.

It is presented, as literature, associated with your newer activities, Hygiene and the History of Medicine.

DR. LAMBERT: In New York or in Baltimore, Dr. Welch, the Professor, will always have an abundant influence on the individual student. He began in New York as a personality. The transfer to Maryland has made him a tradition and we rejoice still a living tradition in Baltimore.

Dr. Ewing will tell us of Dr. Welch, the teacher.

REMARKS MADE BY DR. JAMES EWING

Mr. Toastmaster, Dr. Welch and friends, there are many more deserving, but I am sure none more appreciative of the honor of saying a few words about Dr. Welch as a teacher. I believe the place of this occasion is quite appropriate because, as has been said, Dr. Welch in a way is coming back home to celebrate his eightieth birthday. He waited a long while for this occasion and the Academy is to be congratulated at having him here. As each succeeding occasion of this sort becomes more important with

the passage of time, we may claim that this is the most significant of all the anniversaries to which Dr. Welch has loaned himself. New York is appropriate because it was here that he received his first baptism as a doctor of medicine. It was in the old, to some of us almost historical, days of the College of Physicians and Surgeons in 1875. I suppose that he more than anyone else here, perhaps, can remember the great teachers of those days. I knew them only by name—Delafield, Alonzo Clark and Willard Parker, while Welch, Bull and McBurney were mere demonstrators of anatomy. Then there was the old Bellevue and an equally distinguished line of famous men—Austin Flint, who wrote one of the finest text books of medicine in the English language, Loomis and Janeway, the learned diagnostician—all great men and great teachers. They presented reports and papers and perhaps Welch was not a model student himself, but he listened and gathered there some of the sense of responsibility and ambition which has guided him and inspired him ever since. Let us hope so.

Something drove Welch out of New York. Perhaps it was one of those, I just thought of this recently, perhaps it was one of those terrible art exhibitions by New York medical men which are now featured by the Academy. If so, there was one good result. It gave Welch a chance to go abroad on two occasions where he came in contact with the great pathologists of Germany and an important, intimate contact where he acquired methods of thought and work.

On coming back to New York, he established what was probably the first modern laboratory in Bellevue Hospital where he applied assiduously those methods of observation and investigation which has made Germany the leading nation in pathology since. To be Connecticut born, New York bred, and German trained was an irresistible combination and soon made Welch the leading pathologist in America so when the new school opened in Baltimore, it was inevitable that he should be chosen to head

the Chair of Pathology and the whole project. Knowing the many assets which Welch took to Baltimore one feels that no one was more deserving. There probably never was a more broadly trained American physician nor one who had come into more contact with leading scholars of his day. With this fine conception of scholarship, Welch came back to Baltimore and on this firm foundation his own work and brilliancy was established and that is why his characteristics shine like a beacon light over American medicine.

There were other scholars in those days and the stage was set for a great revolution in American education. In Boston, Fitz Minot and many others lent great distinction to the Harvard group. In New York, I know Prudden maintained an almost ideal atmosphere of scientific endeavor. His work was quite sensational and very thrilling. Studies proceeded but were all very restricted. The schools were isolated and not coördinated.

When the new work began to come out of Johns Hopkins, then we all felt a new thrill of pleasure and inspiration. I will never forget my great delight in reading Thayer and Hewetson monograph on malaria and then followed the very elaborate studies of typhoid fever. Halsted's work and a great line of important studies which for their comprehensive scope established a new standard of clinical laboratory work in this country followed and we all felt it.

Dr. Welch's own contributions I am not able to speak of with authority. I believe that only the author himself can fully evaluate the significance of his own studies—studies on edema and bacteriology took high rank, but I was most enthused and had the most pleasure out of reading again and again Dr. Welch's monograph on cancer of the stomach. I believe you acknowledged once, Dr. Welch, that you *worked* on it. For comprehensive treatment, balance and finished diction, it is a model. It should be made compulsory reading for anyone who attempts to write on a comprehensive subject. This kind of painstaking scholarship

characterized all his work and I think we descry in this work the master hand of Welch.

It is a true saying and one worthy of repetition that no great medical project succeeds without the support of personalities. Dr. Welch took to Baltimore that broad, ample, sympathetic personality which flooded itself through all of the departments of the institution, attracted many able young men, inspired them to superlative efforts, influenced other institutions all over the land and made him the greatly beloved Dean of American Medicine.

History abounds in similar situations. I think the lesson not to be forgotten, especially in these modern days when medical problems take on complexity, think it may be well to remember that no system of organization, no plan, no material resources, no good fortune will ever replace the significance of the power of great personalities on which alone ultimate success is most dependent. For the same reasons, I think, and in another aspect, Dr. Welch has been a tower of strength to the university idea in America. When one considers the enormous influence that the universities have exerted on society from the Renaissance to the present time, one must look with alarm at any thought of the cessation of the university. If there are any who fear that in American Universities ambitions may replace ideas or pedagogy may underrate judgment or abandon adequate training, then to those the presence of Dr. Welch, long maintained in a position of power and prominence, must be a most reassuring subject. But perhaps you may say I am off my topic of Dr. Welch as a teacher. Not at all. These activities, phases of work are necessary for the great teacher. No man can teach more than he exemplifies in his own life. He may have book learning, but the real teacher is the real leader. He must live and represent in his own person and living the high ideals and standards which he teaches and that is Welch. I have reviewed the foundation on which his success has been based.

I never had the pleasure of sitting under Dr. Welch as

teacher or pupil. However, I take pleasure in acknowledging that in New York we have felt constantly the power of his influence and have aimed in so far as in us lay to imitate his scholarship. I have not, therefore, the personal reminiscences with which Dr. Camac has been able to entertain you, but I should think that to Dr. Welch himself his most gratifying service must be found in the power, work, and influence of his army of pupils, many of whom have grown old in service and are familiar to fame.

Modern medicine is only about eighty years old. When one considers the enormous changes that have occurred in medicine in the last sixty years, all of which Dr. Welch is familiar with, he must consider the story like a dream the changes have been so revolutionary. But when he considers that he has lived through it all, has witnessed most of it and through his labors and those of his pupils contributed much to it, it must become a reality. It must be a grand thing to stand on the pinnacle of eighty years of life and service, strong, loyal, triumphant and review the course of events and the ever widening current of his influence upon them. Few have been given that privilege, but it is a sound principle of social philosophy that no man lives unto himself alone, so we too share with Dr. Welch the joy of the splendid retrospect which is spread before him on his eightieth birthday. We wish him continued health and power as the years roll on.

DR. LAMBERT: The latest and most far reaching activity of Dr. Welch is the establishing of a Department of the History of Medicine of which he is the Head at the Johns Hopkins School. So Welch will now continue to influence the younger generations of physicians in that neglected subject, the past and foundation of their science. As a student of history and himself a bibliophile, Dr. Cole will present to us this characteristic of our guest.

REMARKS MADE BY DR. RUFUS COLE

When Dr. Williams asked me to speak to-night he said that what would be appropriate was nothing "high brow," only a few personal reminiscences. I thanked him for the implied compliment and accepted, but I realized that he had assigned to me a difficult, even though pleasant, part. Then when a few days ago he wrote me that I should speak about Dr. Welch as a bibliophile my difficulties were doubled. In the first place although my hair is gray and my children are grown, I cannot forget that I sat before Dr. Welch as a student and I am still conscious of the relation of pupil to teacher. To stand here and talk about him, and especially before him, is to feel as does the little girl when she gives the teacher the bouquet of flowers on the last day of school.

That is one of my difficulties, the other is that I have never thought of Dr. Welch as a bibliophile, that is, in the sense in which that word is generally used. He is a friend and lover of books, but I think his affection is more than "skin deep." It is the soul of books not the outward trappings that attracts him. A bibliophile is generally thought to be one who values a book chiefly because of its age, its rarity and the beauty of its binding and typography. I cannot imagine Dr. Welch's eyes sparkling over the possession of a book simply because it is old and has original wrappers and uncut pages, which of course are the desiderata of the true bibliophile. But though in that sense he is not a bibliophile he is one of the best friends of books I know, at least one of the closest companions. He not only communes with them but he "eats them up" and at a rate that is unique. But strangely enough they do not disappear. He can disgorge them on the slightest provocation! I am told that he has read through the Encyclopedia Britannica, not once but several times! And judging from his apparent knowledge of every conceivable subject I can well believe it. Of course as an old pupil I may have slightly exaggerated ideas of his capabilities, but never have I detected in him the least

ignorance on any topic, from baseball statistics to the theory of relativity or the sources of the Pentateuch.

My first contact with Dr. Welch in his rôle of a lover of history and books came in the meetings of the Johns Hopkins Hospital Historical Club. Soon after his arrival in Baltimore, as pathologist to the Johns Hopkins Hospital, he organized the club. This was in 1890, three years before the medical school opened. At the first meeting, there were 30 men present. Dr. Welch was made president, and he then proceeded to exhibit an English translation of the *Regimen Sanitatus* of the School of Salernum, and to comment upon it.

Later on as student in the medical school I had the great privilege of attending the meetings of the club and receiving a stimulus from them trying to learn something of the works of the masters in past ages. For a considerable number of years I was privileged to attend these meetings, at which Dr. Welch and Dr. Osler not infrequently spoke. If the speaker of the evening did not appear Dr. Welch was usually invited to take his place. He was always ready to speak extemporaneously and we usually felt very happy and fortunate if the scheduled speaker did not appear.

The meetings of the Historical Club exerted a deep and lasting influence on all the students and assistants. They stirred into life a new side of our personalities, the cultivation of which is important, even in those whose chief interest is science. The true scientist requires more than the ability to reason, he needs imagination. As Shelley says—"We want the creative faculty to imagine that which we know, we want the generous impulse to act that which we imagine, we want the poetry of life." There is no better way for the student of medicine to acquire this than by the cultivation of an interest in the origin and development of his own science as shown by the lives and works of its masters. This and much else of the little I know I learned from Dr. Welch. Not in words and precepts, but through the manifestations of his spirit; invisible yet potent.

One of the most remarkable things about Dr. Welch is

his perfect adaptability to all times and places. Like Socrates he is at home everywhere. He is the antithesis of the provincial and chauvanistic. When I lived in Baltimore I felt that he was a Baltimorean. But when I came to New York I found that New York claimed him as well. As president of the Board of Scientific Directors he was the soul of the Rockefeller Institute. Our most distinguished and illustrious members of the medical profession in New York, such as Dr. Delafield, Dr. Janeway, Dr. Prudden and Dr. Jacobi, claimed him as friend and leader, just as did my revered teachers in Baltimore. But not only in the ranks of the medical profession, but also in social life, among business men, wherever I have seen him, in Baltimore, New York, Naples, or London, there he seems to belong. Even as a soldier in the war Dr. Welch seemed not out of place. During the war I went about with him and Dr. Vaughan and Col. Russell visiting the various camps to learn more about the pneumonia prevailing among the soldiers, in the hope that its prevalence might be diminished. I remember our stopping one day at a little station in the South and we all got out to walk up and down the platform. Dr. Welch strode vigorously along, up and down, and of course was the center of interest of all loiterers hanging about the station. Col. Russell and I walking behind him saw two old farmers looking at him with great admiration and interest, and we overheard one of them say to the other. "I'll bet you he's an old war dog." He was an old war dog, but his battle was to save, not destroy.

The most remarkable thing about Dr. Welch, however, is not his adaptability to place, but in time. I think he would have been as much at home among the Greeks in the Golden Age, or the Elizabethans, as he is in the 20th Century. A few years ago I had dinner with Dr. Welch at Dr. Flexner's. When we left he said he was walking down to the University Club and I offered to accompany him. For some time I have been interested in 17th Century medicine in Italy, and I thought that I might venture to speak of this period without displaying too much ignor-

ance. So I ventured to speak of Athenasius Kircher, that remarkable man, Fellow of the Society of Jesus, who like Dr. Welch, was interested in everything, from the theory of infection to flying machines, but who, unlike Dr. Welch, allowed his power of imagination to gain control over his powers of observation. I had no more than mentioned the name but Dr. Welch was off. He told me about his life, his interests, his associates, his times. It was as though we were talking about Dr. Kelly, or Dr. Halsted in Baltimore. And when we reached the Club it seemed that he was only fairly started. It was almost uncanny.

Then two years ago I was with Dr. Welch in England attending the celebration of the Harvey tercentenary. We were together at a luncheon at Cambridge, and after luncheon Dr. Nuttall, formerly of Baltimore, but now a Fellow of Magdalen College, asked Dr. Welch and Professor Sherrington if they would not like to see Pepys Library, of which Dr. Nuttall is now one of the custodians. Dr. Welch kindly asked me to go along. As you may know, this library was bequeathed to Magdalen College with the proviso that it must be kept intact, and that if even one book were lost, the library should go to one of the rival colleges. As you may imagine the library has been kept with scrupulous care, under lock and key, and to visit it is a great privilege. For many years indeed, a committee from another college visited the library each year and carefully counted the books to see that none were missing. It is a perfect 17th Century library kept in an old room, in the original cases, just as Pepys arranged and left it. It is surprising to find that he had arranged his books with meticulous care, but not as Dr. Welch would have done. They are arranged not according to subject but to size! If a book were slightly less tall than its companions, Pepys had a small block made with an artificial binding on the back corresponding to that of the book, and that block was placed under the book to raise it to the desired height. Now as soon as we entered the room Dr. Welch was at home. He took down books from the shelves, talked familiarly about the authors, and of the

interests and activities of the times. He talked like a contemporary of Pepys.

As you all know Dr. Welch is now organizing and developing what is to be the great Welch Library of Medical History. Just as he has conducted all of his great undertakings, he is not doing this in the conventional way. This is not to be a mausoleum in which dead books are deposited, but it is to be a laboratory, a workshop, where history can be studied and historical discoveries made. It is to contain not only books but workers. And already Dr. Welch is attracting to himself some of the most productive and learned men in this field. One may be sure that out of it will come most important contributions. Is it not interesting that in this comparatively young and new country of ours, the history of medicine is to develop into a living thing, a new science, to shed new light on the nature of this world of ours.

Two years ago Dr. Welch was abroad collecting books for this library, not necessarily first editions, though he wants them, too, but books about everything relating to medicine. One day in Paris I went with him to an old shop across the Seine. The proprietor, knowing he was coming, had collected together a great pile of books for him to look over. Among them were many, the relation of which to medicine was at first sight obscure. I remember his handing me an old book on perfumes. Did I think this subject had any relation to medicine? It did not seem very obvious to me, but Dr. Welch soon enlightened me. I found it had many connections. His statements were convincing and the book joined the others to go to Baltimore. After I had left him I remembered a message I wanted to give him and I turned back to join him. I saw him standing all alone before one of the old book stands along the quay on the left bank of the Seine. He was poring over the old books. It was twilight and the setting sun was casting its last rays on the towers of Notre Dame which formed the background. That picture will long

remain in my memory and is the best one I have of Dr. Welch as a bibliophile.

Before Dr. Williams asked me to confine my attention to Dr. Welch as a book lover I had had the temerity to compose a few verses about him. Since this is an informal occasion and since, through this evening's contact with Dr. Welch you have all acquired something of the spirit which makes him, as Dr. Osler said of Oliver Wendell Holmes, "smile at the foibles of others and over their weaknesses drop a tear," I am going to venture to read them to you.

WILLIAM HENRY WELCH

'Tis not in measured rhymes of valorous feat
In tilt or joust, or clash or battle's roar
That future bards will stirring tales repeat
Of this great knight, as of the knights of yore.

Their songs, of great, but peaceful deeds will tell
Of him who sought, the Python's darts to find
By search intent through every part and cell
Of corpses dead; and thus to save mankind.

Of how he led the youths who sought to know
The secret ways of Nature, the myst'ries of Life,
Taught how to fight disease, man's greatest foe,
And as Apollo's son to wage the strife.

But not the sick to heal, or teach to heal,
Was he content. The multitude cry out
"The foe must be forestalled." On this appeal
He organized a host, disease to rout.

Scientist, teacher, leader, sage and friend,
Custodian of knowledge gained throughout the ages
Your noble acts will themes to future poets lend,
Your deeds will shine on histories' glorious pages.

DR. LAMBERT: It has seemed to the Committee who had this dinner in charge appropriate that some tangible means of recognition of our interest should be presented to

Dr. Welch and we have selected two books. We wish to present the first English edition, 1640, of Bacon's *Advancement of Learning* and to the citizen of the world and the philosopher, De Chambres' little book, *The Art to Know Men*, first English edition by John Davis in 1676. It will show Dr. Welch how a predecessor of his viewed a similar subject in which he is very active. To the man and Fellow of this Academy, I am pleased to hand Dr. Welch a resolution from his colleagues which has been signed by every person in the room.

REMARKS MADE BY DR. WILLIAM H. WELCH

Dr. Lambert, Ladies and Gentlemen, Fellow Academicians. I thought when the suggestion was made to me in Baltimore that I should submit to a banquet and I positively declined, that that really was a quietus on that proposition. When I received a telegram from Linsly Williams saying that some of my friends in the New York Academy of Medicine desired to honor me with a banquet I interpreted it as essentially, as has already been expressed, an opportunity to come home to an intimate and almost family gathering. I thought therefore there was no particular opposition between my former and first decision declining an elaborate anniversary banquet and a family dinner at my old home in New York, so without even consulting my calendar and not even noting that I had rather a strenuous day before it, I promptly accepted by telegram to Linsly Williams. I very much appreciate your invitation to come here for this occasion. I have really no words which can express adequately my grateful appreciation. I do regard it, large as the assembly is, as in a measure a family and intimate gathering. I do regard it as a coming home at least to the early scene of my medical education and beginning of my professional life—scenes which I have cherished all these years and which I hold very dear and I cannot begin to tell you how much I appreciate the presence here of so many who were my friends, not a few my pupils, many my colleagues and

associates in their early days, some of them the sons of those who were my colleagues and associates at that time. I can't begin and I should not endeavor to call their names, but I can't help expressing my delight that Dr. Pupin has come here tonight, a dear friend and a cherished associate these many years, a townsman in my native town in Connecticut. I was delighted that Henry Fairfield Osborn, who whispered in my ear that there were reasons why he would have to leave early, should be here and I will explain later why I particularly appreciated his coming.

I have listened to these speeches. I appreciate them immensely. If I accepted at its face value all that has been said, I should hardly be able to stand on my feet and speak at all. I don't think I have any great illusions as to my services to medicine and medical education, so little so that while it is delightful and pleasant to hear these tributes, I am frank to say that I only appropriate a certain fraction to myself. I want to thank Dr. Smith, Dr. Camac, Dr. Cole, and Dr. Ewing who have spoken with great discrimination, for what they have said. I am glad Dr. Ewing mentioned my dear friends and colleagues, whose names should be mentioned, such as Dr. Prudden. Dr. Cole and I have a number of stories to tell on each other in our experiences on the other side.

Just before I came up here, I was sitting in the library at the University Club reading the Life of Mark Twain. I was reading an account of his speech at a dinner on his seventieth birthday. It was rather a small dinner. I jotted down what he wrote and am rather inclined to think I will use it. It is rather delightful. It is probably an appropriate attitude of mind for one who has reached three score and ten. "Three score years and ten. It is the scriptural statute of limitations. After that you owe no active duties; for you the strenuous life is over. You are a time-expired man, to use Kipling's phrase, you have served your term, well or less well, and you are mustered out. You have become an honorary member of the republic, you are emancipated, compulsions are not for you,

nor any bugle-call but lights out. You pay the time-worn duty bills, or decline, if you prefer—and without prejudice—for they are not legally collectible.” I hadn’t time to write more, but isn’t that delightful. That indicates that ten years ago I ceased the strenuous life. I don’t see Dr. Dana here at the moment, but I received from him a number of gifts for a child about ten years of age, some balloons, etc., no doubt based on a correct interpretation that I am in my second childhood. I know I have reached the age of anecdotage.

It was suggested to me that a few reminiscences of my early days here in New York might be appropriate. I would like to say at the beginning that if you have read the autobiography of Haldane (he did not live to revise the book; it was edited by his sister) you will recall that in the last chapter she says that some colleague asked him whether if given the knowledge and experience he possessed now he would care to start over again, live his life again. He deliberated and then said, “No” and the reason he gave was that he couldn’t count upon the good fortune which he had had in his life which was even to him an obviously successful one. So much depends upon chance. I should make the same answer, could I start over again and expect at eighty years of age to be here at such a gathering of friends and should I have the opportunity which has been presented to me to which I owe everything. It has been the time, the opportunity, the friendship, the loyalty, the host of pupils and friends and associates to which I attribute whatever share I may have had in the advancement of scientific medicine and medical education in this country.

Now, one of the great opportunities came to me here in New York. You referred, Mr. Toastmaster, to the rather sickly condition of the medical schools at that time. They were as you read about them and hear about them pretty bad, but those of us who studied here in the early seventies were inspired by our teachers with as much enthusiasm as the students are to-day. That is, is it not, the gift of the

teacher to be able to inspire the student? We looked up or I did to my teachers of those days, Alonzo Clark, Smith, T. Gaillard Thomas and all those you have mentioned. The elder Delafield was President of the Academy when I was a student. I look back to those men with reverence and admiration and feel that I got something. Your brother, Simon Flexner, Mr. Abraham Flexner, thinks it is because of my good nature that I say these things about what we were able to get out of the medical school at that time.

I was singularly fortunate at the very beginning of my medical studies in having John Curtis ask if I cared to be a prosector. That meant going down into the room below the dissecting room with Sabin and J. C. McBurney where I spent days and nights in association with them; McBurney who had recently returned from Vienna expecting to practice a specialty, laryngology. That meant more to me, that kind of intimate friendly association, than I could have learned by sitting on the benches listening to lectures.

There was another part of my education which was more unique. I regard myself practically as the graduate of a library, that was almost my alma mater. At that time, the best library in New York City, which is now housed in this building, was that of the New York Hospital. The New York Hospital had moved and the building on 15th Street was not opened until 1878 or 1879, but their library was housed in the old Thorne mansion in front of the hospital. I used to go in through that dignified gateway, and this was the extraordinary privilege which I had which I owe to Dr. Sabin. He secured from the library, which was almost a deserted mausoleum open an hour or two during the day, the key and gave it to me. I wonder now how a student could have been so trusted. I was given the key and spent days and nights there, often staying there until midnight. That was the day in which a prize was offered for the best graduating thesis. Sabin suggested the subject and encouraged me to enter into the

competition. I think the education I got reading in that library, German and French, was on the whole a pretty good education. So the results possibly were not quite so bad as they might seem to be from a mere statement on paper of a mere three years course, the first at college, my father having a doctorate and being my preceptor, and two years taking up more tickets, each time seven tickets, and listening to lectures. I can give you but little idea of the atmosphere and spirit of these young men who had enthusiasm and zeal coming in contact with stimulating and inspiring minds of Sabin, Dalton, McBurney, and John Curtis. Those were the days in which you could have an examination for internship at Bellevue which ranked first for hospital service, six months before you got your degree and I did so, entering in the autumn of 1874. Of course I have always regarded the experience of the hospital intern's acquaintance with disease present in the living patient as a valuable asset.

After that I went abroad and I do feel that my two years there was really what gave me the success or the opportunity for what success I may have had. Others were going abroad and training for specialties. If I had trained myself in some specialty such as nervous diseases, which were my particular interest, if I had come back trained merely in a specialty, I should not have the particular kind of an opportunity I had. I chose to train myself in pathology. I don't believe there is a key quite so significant for the field or to introduce laboratory work and scientific medicine through medical education quite so well as pathology. That was a very remarkable group that I was associated with for eight months in Breslau. I don't hear of many young men who get quite the stimulus which I received there. I had gone to Strasbourg first and then to Leipzig. Ludwig did not like Virchow and said: "Warum gehen Sie nach Berlin? Virchow ist eine ueberschätzte Grösse. Go to Breslau; I will write for you to Cohnheim." They were all foreign born students, no other English speaking students there at that time. I don't believe there has ever been quite such an atmos-

phere. There was Ehrlich working with aniline dyes who developed the smear method, there was Neisser and Rosenbach. I was taken right in in a way I would not have been anywhere else. I went to their gatherings and picnics and discussions. Now young men don't get, I think, quite the contacts which we had at that time. It was the dawn of Koch's work on anthrax. He came to Breslau and showed us his work. I will never forget his coming through the room with Cohnheim. I have often reminded Koch of it. I was greatly impressed with the coming bacterial era, which had not dawned until Koch went to be health officer in Berlin.

That was the kind of stuff I had in my head when I came back to New York and you can imagine that I was looking for a laboratory. I was a graduate of the College of Physicians and Surgeons, and I had great admiration for Delafield. He said to me, "We would like to have you teach pathology. You could take over my summer courses. If you can find a room in this building which you can use for a laboratory, you are welcome to it." I went over the building from top to bottom, but there was not a nook or a corner to be used. Delafield said, "I expect to succeed Alonzo Clark in the Chair of Medicine, but as long as I hold it, there will not be an independent Chair of Pathology."

They offered me two rooms and to go to some expense to add a connecting room, making three rooms joining each other at Bellevue Hospital Medical School. That was just what I wanted. There I started in 1878. As I look back, I think Dr. Ewing was correct in saying that this signifies something. I am sorry that Osborn has left the dinner, because I don't think you can get a more striking example of the changes which have come over the opportunities at least for biological study or in particular work in biological sections in New York than to note how Henry Fairfield Osborn landed in my laboratory. His father was a very well known man, President of the Illinois Central Road. His mother introduced the system of trained nurses

at Bellevue. They were delightful, important and influential people. Young Osborn had just graduated from Princeton and they wanted to keep him at home. He had planned to go to work with Huxley. He went all over New York, to Columbia, to New York University, looking for a place for a laboratory. Finally he landed in my primitive quarters in Bellevue. It was the only place where there was an opportunity for him to pursue his studies in a laboratory, in a way that may have had a limited bearing on his future interest and study. I am delighted that he came here to-night and have been pleased with the reference he has made in his publications. He has always been kind enough to refer to our early days. He started a group of Princeton men coming to us, including the celebrated Alexander Dumas Watkins, who got me into trouble by spreading handbills around the lower East side that I would do injections on cadavers to show inoculations. Archibald Alexander spent his evenings going over the anatomy of the brain there. It was rather an interesting group of extramural workers. Some good work came out of it. I was pleased to get the other day a letter from Henry Cochran who worked there and published a very excellent paper on a study of tumors. Dr. McNutt, Nelson, and Halsted came and worked there. It was a little group of students. Carlisle was among them and I think the slides he made then compare well with the slides made to-day. He produced examples of the tubercle bacillus good enough to make photo-micrographs of.

I agree with Osler, if he is correctly interpreted, that the productive, creative thought of the world is done by those under forty. This does not mean that a man may not be a good business man or a good justice. My most active vigorous years were here at New York. They were hard times; I worked day and night, had to make some sort of a living. Dr. Goldthwaite and I played the rôle of quiz masters. It was a life-saver. But we both gave it up at the height of our prosperity. Although it was very successful at that time, it was abandoned spontaneously. We agreed that it injured the students as well as ourselves.

I spoke of it a while ago before the College of Physicians and Surgeons. We dealt in autopsies, and had the run of Bellevue Hospital for a time. Then my students were mostly from the College of Physicians and Surgeons. Walter James, George Tuttle, and Woolsey came. So at the end of the year Delafield saw that things were going pretty well and I was invited back under conditions that at one time I would have jumped at. But I felt that I would be a traitor after all that they had done for me at Bellevue if I abandoned them, so I declined very reluctantly. Delafield asked me who they could get and I suggested Prudden, and they certainly were fortunate to get him—more fortunate than if I had gone. We had been together in Vienna. I don't like to have my name mentioned without Prudden. He fitted up the old tunnel under the College and started to work. He was so retiring, but did wonderful work and had a great influence, and never got quite the recognition he should have.

About that time the coroner asked me if I would make his autopsies for him. I said I would if I didn't have to go all over the city. I did have to go to Flatbush once. Then I was pathologist at the Women's Hospital. It was a lovely and active time. Cole reminded me of those days. They were my best years, the active years. I think all of my interests or the seeds of them were started there.

What I count as especially good fortune was association with Austin Flint, the greatest mind at that time. He was a man of wide vision. He asked me to read the pathological sections of his book. I criticized it somewhat at the time and it was all re-written later. He asked me to help and I was allowed a perfectly free hand with sections on general pathology, anæmia, thrombosis, etc. I did not touch the pathology of the liver which was written by Austin Flint, Jr., and contained an account of his discovery that the liver excreted cholesterin (1862). Later I learnt in Germany that Austin Flint Junior's work was laughed at but on looking back I venture to say that the only section of any historic interest and value was that. I believe it is the only thing to be remembered in that part

of the book. It meant a great deal to me to have this association with Flint and his text-book.

These early days have come back to me; I am not going to talk about the later days, but I do feel that the stimulus came to me and the thoughts, however they may have turned out later, were there before I was forty. And I think that was all Osler meant.

I have often said that I was called to Baltimore on the advice of John Shaw Billings. He used to come and sit and listen to me teach. I have never forgotten one time he sat there the whole afternoon much to my embarrassment. I was giving out sections of tubercle and gumma of the testes. Within a week, I got a call to Johns Hopkins. I rather think Billings was the decisive factor. I don't know. He became one of my most intimate and closely cherished friends and I think what he said went at that time.

I like to recall the New York period. It seems so primitive to think of that little laboratory there, but it meant a great deal in those days because the subject was bacteriology and pathology.

I went abroad and worked a year and shall never forget my contact with Pasteur or the way he received me and showed me around his laboratory. I have since read how reluctant he was to be interrupted and I wonder how he came to lay down his test tubes (I can hardly think of it without tears) and showed me around the laboratory. Since then I have had associations with Roux, Calmette, and the delightful group.

I think the young men of to-day miss something. It isn't that they have to go abroad to get all these things. I met some of them on the other side and I know that things have developed so that they can get the best at home. But they miss something in the way of contact. I knew Ehrlich intimately and kept up the friendship with him. I have his long water that came in August, 1914, when the war injured nothing what it meant to him. He

never did any work after that. All that association has meant more than I can tell you in my life.

Is it not possibly appropriate just to recall what the opportunity and occasion was for the young man. How fortunate he was in bringing back the particular professional wares that he did. The germ era was dawning. The tubercle bacillus had just been discovered.

Don't be too severe on me for being in academic harness at this octogenarian period. I resigned the important Chair of Bacteriology and Pathology when I was sixty-six. I regard that as letting me out to some extent from this shocking situation of an octogenarian starting a new undertaking—the organization of an institute of the history of medicine and endeavoring to take the difficult job of administering a school of Hygiene and Public Health which was a unique opportunity because it was a novel experiment—not being a mere institute but a laboratory attempting to take account of the fact that the subject of public health training had become so technical and so specialized that the ordinary medical institution could not cover it, that at least a year or two of subsequent training was required. The problems were like those of a medical school. What were the fundamental subjects? Was it possible to carry out the right idea that the Heads of Departments should be interested not merely in training but also in research? The difficulty is that the reward for this service is not such as to attract as many of the right quality as should be attracted.

Now I am very much interested in getting something going in the way of an institute of the history of medicine. Here again is a subject by itself, but I am trying to stress to-day the humanistic aspects of medicine because in the past the whole emphasis was, in my case and I think the times demanded that emphasis, upon the purely scientific side. But I do think we want medical humanism. Humanism for a particular kind of propaganda. I am disinclined to use that term. Just as I protest against the venereal groups' use of the word social hygiene to cover that field.

Sciences, than in Oxford, Cambridge or the great Paris Faculty itself. But at Leyden, Leipzig, Halle and Wittenberg, universities created by popular (or, at least, *bourgeois*) fiat, there were evidences of strong national solidarity and of intense rivalry—a sure index of going concerns. At Göttingen, a more recent creation of the house of Hannover, the aim was practical efficiency vs. *odium theologicum*, and of Göttingen, Haller was to become the leading spirit, utilizing, in an entirely modern manner, those novel agencies of progress, the library, the scientific society and the scientific periodical. Over all stood the great figure of Newton, revered alike by Haller and Voltaire as the expositor of a universe regulated by mathematical laws, Deocentric for Haller, anthropocentric for Voltaire. Newton, Locke, Shaftesbury, Bolingbroke were all Deists, an 18th century variant of Unitarians; but Haller, the devout Bibliolater and *defensor Fidei*, “thinks and prays,” while “Voltaire only thinks.” With commendable cleverness, d’Irsay elucidates these shades of difference by citation from the didactic verses by which both will be best remembered as poets—Haller’s apostrophe to Newton in *Die Alpen* and Voltaire’s *Epître à Uranie*. Here Haller is sad and pensive, like Matthew Arnold in “Resignation,” Voltaire serene, cool, agnostic, tending visibly toward the biologic pessimism of Darwin and Nietzsche. The young scholar’s handling of this perilous theme is singularly mature, through his capacity to deal with the ideas and social forces at play like pieces and pawns on a chess-board. He sees Voltaire clearly as the truer child and prophet of his particular period, while Haller stood upon the ancient ways, like Lord Kelvin in his duel with Huxley about geologic time. Haller, meditating on Newton and mourning for his Mariane, is not far removed from the Matthew Arnold of the Grande Chartreuse poem, the Brahms of *Vier ernste Gesänge* or even Richard Strauss in *Allerseelen*. The Voltaire of *Les systèmes* is already like Stendhal (*La seule chose qui excuse Dieu, c’est qu’il n’existe pas*) or Mencken on the Gods or Stravinsky’s trait of making the orchestra mock and sneer at music itself.

In Voltaire's *in nova fert animus*, there is a whiff of the Russians of the extreme left: revolution, "red ruin and the breaking up of laws" were sure to follow. Yet from the clash of such opposing tendencies is the historic process evolved and, at this time of day, we should be far from ridiculing Haller as a dumb *bourgeois* and Philistine, as did Goethe and Maupertuis. To-day, he would be an exponent of the social forces defined by Roosevelt as "centripetal," guaranteeing the certainty of rolls and coffee for breakfast, a full dinner-pail, clothes on your back, a roof over your head, and business as usual. Nor did Haller lapse into such sterile 18th century ineptitudes as *qu'ils mangent du gateau* or "Eat your pudding, slave, and hold your tongue." One senses the wise, benignant physician, the true friend of humanity.

The most brilliant chapter in the book is the *Anatomia animata*, for here we grasp the secret of Haller's eminence as a physiologist. Imbued with the Newtonian concept of a world mechanically ordered, a universe susceptible of study and interpretation as mechanism (*Theos geometer*). Haller injects the dynamic idea into muscular contraction, and lo! the old Galenic teleology falls to the ground. Under Haller, anatomy itself becomes an experimental science. Many novel findings, wrested from his obscure Latin pages, are here presented for the first time, illustrating Verneuil's idea that erudition, under good generalship, merges into creative interpretation. The succeeding chapter, on irritability, is not so satisfactory. The reasoning is too abstruse and metaphysical, and the real outcome of the Glisson-Haller doctrine, the distinction between muscular contraction (irritability) and nerve-impulse (sensibility), let alone its relation to Ehrlich's side-chain theory, is not elucidated. But the Cnidian mania of the 18th century for minute and multifarious classification, its effect in accelerating the description of hitherto unknown diseases, is clearly expounded, and for the first time, we see Haller himself as a precursor in experimental clinical medicine. In the following chapter, we learn of his work in experimental pharmacology, his unapproachable achievement in

medical bibliography, his weakness as medical historian. Haller, the physiologist, emancipated himself from Galen. Haller, the clinician and historian, is still under the spell, a brooding naturalist, incapable of moving into the biochemic view of things, which even Paracelsus, Van Helmont, Franciscus Sylvius, Boerhaave, Friedrich Hoffman and Van Swieten, had surmised. The last chapter is a going exposition of the social and intellectual forces which were to submerge Haller: how the world of *comédies lar-moyantes* and "sensibility," in which he lived, moved and had his being, was overthrown by the metallic humors of the Revolution—

"Beneath this stone the Man of Feeling lies,"

and how the stilted classicism of the Napoleonic period had its natural outcome in the Romantic movement, which momentarily supported Haller, as the later period of mordant scientific realism passed him by—

"I laugh when Mrs. Haller cries:
My heart is surely ossifying."

Haller, like all the great 18th century physicians, stood on a pedestal, now seen from the Nietzschean "pathos of distance."

The author's conclusion of the whole matter is a jubilant scholar upon the Lamartine apotheosis of those rational mature, (*ensées fortes*), which set the mind and spirit free social for mankind to breathe in an ampler and more re-board. He atmosphere—prophet of

the ancient *montent, montent toujours, par d'autres remplacées, redescendent jamais!*
about geologi

mourning for book opens out many new and striking views Matthew Arnoings, and will shortly appear, revised and Brahms of *Vier* English dress.

Allersceelen. The
Stendhal (*La seui
n'existe pas*) or Men
of making the orche

F. H. GARRISON.

ON THE TRAINING OF SPECIALISTS

To be called a specialist, whether in general surgery or a surgical specialty, or in the various branches of medicine, should indicate to the profession as well as to the public, that a doctor has special qualifications and that he has had special training beyond that required of the general practitioner.

Modern medicine has grown so rapidly that the subject has become very complicated and has made it impossible for anyone to be familiar with the diagnosis and methods of treatment of all the various specialties. The result has been the growth of specialization to a degree formerly unknown. This rapid growth has led to mal-adjustments with resulting difficulties. Many men have engaged in a specialty without being properly qualified. Individual members of our profession, as well as organized groups of medical men have recognized this and have devoted considerable study to the problem. It is evident that in addition to the knowledge acquired by a general practitioner a specialist must be familiar with the anatomy of the parts, the pathology and diagnostic methods pertaining to his specialty. He must know the relationship between affections of special organs and the body as a whole, and he may have to acquire technical skill in the use of certain instruments used in diagnosis and treatment. In the case of the operating specialties he must, in addition, acquire a perfect aseptic technic, dexterity in the use of instruments, and he must have knowledge of the structure as well as function of organs and tissues. All this requires time and special study.

The recognition of this principle is so simple that one wonders at the lack of provision which has been made for the training of specialists. It is a curious fact that the state is not concerned with the further education of a medical man after he has been granted a license to practice. But for his own conscience, or the lack of confidence

of a patient, a young graduate may engage in any form of practice or perform the most difficult and dangerous operations so soon as a license has been granted him. In many states not even an ordinary internship is demanded.

This is evidently not to the best interest of the public, and for a long time it has been recognized that there is definite need for improvement in medical education, especially graduate education. In several of the more progressive countries of the world either the state or medical organizations have studied the problem and are applying remedies to serve their purpose. In this country also more or less successful efforts have been made to provide graduate courses in medicine and to place them within reach of the men desirous to take them. Several universities have established complete departments or separate courses depending on their facilities. Some of them even offer an advanced degree for work accomplished. A large number of hospitals have created residencies of from one to two years which serve as training for a specialty, and there are other agencies, notably National Medical Societies, which are doing a great deal to raise the standard of specialists.

The entire subject is a difficult one and much thought and discussion will be required before any uniform systematized method can be adopted which will approach in scope and value that which is now recognized as a standard undergraduate training.

Many questions will arise and will have to be answered. Just what do we mean by graduate education, how much more time will a young doctor have to spend after his regular internship before he can qualify as a specialist? Can the courses be given while a man is doing general practice or must he devote all of his time to them? Is it advisable to serve only a residency or fellowship at a hospital under a competent member of the attending staff, a sort of practical apprenticeship or advanced internship, or must he have in addition to that courses in the basic sciences at a university? To answer these we must know

what are our aims. Are we trying to train teachers or practical specialists? The former group probably have a definite program and with the irrepressible spirit of research within them will overcome all obstacles and find a position in some university. Apparently, what we need is a minimum standard for the average practical specialist in medicine and its subdivisions, in general surgery and in the surgical specialties.

We know that there are at present men claiming to be specialists who have not had the necessary training to be entrusted with the care of difficult conditions or the performance of serious operations, and who should not enjoy the confidence of their colleagues or the public. We also know that there are many men anxious to take courses to qualify them for the practice of a specialty, and we know that many of our hospitals have the clinical material for teaching and an attending staff able to teach. The medical schools are at present not equipped to coöperate in this field at all or not on a large scale. What can be done to interest them in this subject and to enlist their aid? To answer this question and to bring about coöperation between the various agencies concerned is of vital importance.

Mindful of its responsible position in the City of New York with its enormous clinical facilities, and also mindful of its obligations to the public and the profession, the Academy of Medicine has undertaken a study of this entire subject. More than two years ago a subcommittee of the Committee on Medical Education was appointed for the definite purpose of making a general study of graduate medical education and the training of specialists, and to make recommendations and draw up plans for the training of specialists in New York City.

The subcommittee has devoted a great deal of time to the subject and has drawn up two lengthy reports which were submitted to the Committee on Medical Education and later to the Council of the Academy. These reports include a general study of the training of specialists with

conclusions regarding the necessity for such training and suggestions for their practical application.* The plans submitted seem feasible and require the coöperation of the Medical Schools and a selected group of New York City Hospitals with the Academy of Medicine. In order to start this coöperation a meeting was held at the Academy on April 11, 1930, under the auspices of the Subcommittee on the Training of Specialists, and was attended by representatives of all the Medical Schools and all the invited hospitals. A general outline of the proposed plans was presented and each delegate was given a copy of the full reports for study and submission to the Medical Board of his institution. It is hoped that all invited institutions will become interested in the subject of graduate medical education and will coöperate with the Academy in developing a practical plan which will help make New York City a great medical center, and fill a long felt need.

Subcommittee:

JOHN C. A. GERSTER, M.D.

EDWARD H. HUME, M.D.

JOSEPH MCCARTHY, M.D.

SAMUEL McCULLAGH, M.D.

EDGAR STILLMAN, M.D.

GEORGE GRAY WARD, M.D.

CARL EGGERS, M.D., *Chairman.*

* A copy of the full reports may be obtained by writing to the Medical Secretary of the Committee on Medical Education.

RESOLUTION PASSED AT MEETING OF COUNCIL,
MAY 28, 1930

WHEREAS, Authority for the control of the practice of medicine is vested in the several states and not in the Federal Government, and

WHEREAS, The law of the State of New York and of other states requires of every physician, holding a license to practice medicine in the State, that any communications from his patients shall be kept secret, and

WHEREAS, The regulations of the Volstead Act for the enforcement of the 18th Amendment and the provisions of the Harrison Act require physicians to state the diagnosis of the disease or ailment of the patient on the stub of every prescription they write for alcohol and on every prescription they write for narcotics, and

WHEREAS, The stubs of all prescriptions for alcohol must be surrendered to Prohibition Commissioners for inspection by them and their clerks, and all prescriptions for narcotics are open to inspection by Federal Agents, now, therefore

BE IT RESOLVED, That the Council of The New York Academy of Medicine protests against those portions of the prohibition and narcotic laws which deprive the citizen of his age-old right to privacy regarding his diseases and ailments, which compel the physician to betray the confidential communications of his patients, to violate the ethics of the medical profession and to violate the laws of his State, and

BE IT FURTHER RESOLVED, That this resolution be published in the Bulletin of The New York Academy of Medicine and a copy thereof be sent to the Secretary of the American Medical Association and to the Speaker of the House of Delegates for such action as may be deemed appropriate.

RECENT GIFTS TO THE ACADEMY

During the last few months the Academy has received an anonymous donation of \$10,000 to perpetuate the name of Dr. William S. Halsted, formerly Professor of Surgery at Johns Hopkins University. The income is to be used for the purchase of books on surgery or for lectures or any other purpose directed by the Trustees.

A gift has been received from Dr. Seth M. Milliken of \$500 for the endowment fund.

A gift of \$10,000 is being received from the Carnegie Fund for the use of the Press Relations Bureau during the years 1930-31.

A gift of \$6,000 is being received from the Milbank Memorial Fund for the use of the Press Relations Bureau during the years 1930-31.

A gift of \$1,500 has been received from the Carnegie Foundation for the work of the Governor's Health Commission.

A gift of \$47,500 is being received from the Commonwealth Fund for a study of infant mortality.

A gift of \$8,500 has been received to be administered by the Academy, for the work of the National Committee on Medical Nomenclature.

A gift of \$15,000 has been received from the Altman Fund for the general purposes of the Academy during the year 1930.

An unusual collection of busts of famous physicians, in caricature, has been received from Miss Mary Hall Sayre and also the surgical instruments formerly belonging to her father, Dr. Lewis A. Sayre.

A bronze bust of Dr. Willard Parker has been received, presented by his great granddaughter Mrs. Laurence G. Payson.

An incunabula, "Nicolaus Salernitanun" has been donated by Dr. A. S. W. Rosenback.

\$2,000 has been received from Mrs. Elizabeth Cochran Bowen for the Alexander Cochran Bowen Scholarship, describe elsewhere in this Bulletin.

COUNCIL ACCEPTS SCHOLARSHIP

At the May meeting of the Council a letter from Mrs. Elizabeth Cochran Bowen was presented in which she offered The New York Academy of Medicine the sum of \$2,000 for one scholarship for a physician of either sex who had completed his service in a hospital in the Metropolitan district which accepts charity patients. Mrs. Bowen suggests that the scholarship be awarded to such graduates who would be unable otherwise to undertake any further study. The scholarship provides a stipend of \$1,900 for a year's foreign study, the appointment of the scholar to be made by the Committee on Medical Education of the Academy, and for the primary purpose of preparing physicians for work in clinical medicine. The scholar is expected to carry on some clinical study and at the end of the period to make a clinical report which if sufficiently worthy would be read before the Academy or one of its sections.

Mrs. Bowen generously suggests also that a small percentage of the income be used by the Academy for the administration of the fund and that it is her hope and expectation to provide additional scholarships in the future. This very significant proposal was unanimously accepted by the Council and the management of the scholarship placed in the hands of the Committee on Medical Education.

A Special Committee of the Committee on Medical Education was appointed consisting of Dr. Harlow Brooks, Dr. Nellis B. Foster, Dr. Howard F. Shattuck, and the Director, to select a candidate who would be able to undertake foreign study on this scholarship this summer. This Special Committee met accordingly on June 16 and after interviewing seven applicants, unanimously agreed upon the nomination of Dr. Helen J. Rogers of New York, who is just completing her service at Bellevue Hospital. Dr. Rogers is a graduate of the Long Island College Hospital Medical College and has been an interne on the

Fourth Division at Bellevue Hospital. She is just completing her houseship on the neurological service at Bellevue Hospital.

Dr. Rogers expects to continue her studies on multiple sclerosis under the direction of Sir James Purves Stewart in London and at the Saltpetrière in Paris.

LIBRARY NOTES

APPOINTMENT OF MR. L. L. MACKALL AS CONSULTANT IN BIBLIOGRAPHY

At its meeting on March 26, 1930 the Council of The New York Academy of Medicine unanimously voted upon the recommendation of the Library Committee that Mr. Leonard L. Mackall be given the title of Consultant in Bibliography. Mr. Mackall is not a medical man but is a graduate of Johns Hopkins University where he fell under the spell of Osler. He was a great help to Osler in collecting books and was recognized by him as one who would aid in completing the catalogue of the library which was left to McGill University. This Mr. Mackall did, and also presented many valuable volumes. He was one of the editors of Osler's *Evolution of Modern Medicine*, published in 1921.

He was the first and only librarian of the De Renne Georgia Library of Savannah (1916-1918) and is responsible for its catalogue. From its inception he has been editor of the department "Notes for Bibliophiles" in the literary supplement of the *New York Herald Tribune*. He is a member of various learned societies, is on the Library Committee of the Grolier Club, and is generally recognized here and abroad, in medical as well as non-medical circles, as having profound bibliographical knowledge, for instance about the life and works of Michael Servetus. Some people know books: a few know editions: Mr. Mackall knows copies.

He was of great service to us in organizing our exhibition of "Early Medical Americana," and has donated valuable books to the Academy. When he is in town (for about a half of the year) scarcely a week goes by that the Librarian does not seek his advice and he has given of his time unstintingly.

ARCHIBALD MALLOCH.

RECENT ACCESSIONS

- Ariëns Kappers, C. U. The evolution of the nervous system in invertebrates, vertebrates, and man.
Haarlem, Bohn, 1929, 335 p.
- Barton-Wright, E. C. Recent advances in plant physiology.
London, Churchill, 1930, 352 p.
- Bayer, G. & von den Velden, R. Trattato clinico di incretologia ed incretoterapia..
[Milano], Ist. Sieroterapico Milanese, 1929, 382 p.
- Béclère, C. La perméabilité et les obturations tubaires.
Paris, Masson, 1929, 250 p.
- Beer, E. & Hyman, A. Diseases of the urinary tract in children.
N. Y., Hoeber, 1930, 318 p.
- Blum, P. & Schaaff, E. Le daltonisme.
Paris, Masson, 1929, 131 p.
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München, Bergmann, 1929, 806 p.
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Phil., Lea, 1929, 495 p.
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Edin., Livingstone, 1930, 411 p.
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N. Y., Macmillan, 1930, 514 p.
- Crummer, L. Clinical features of heart disease. 2. ed.
N. Y., Hoeber, 1930, 415 p.
- Currie, J. R. A textbook of hygiene.
Edin., Livingstone, 1930, 844 p.
- Davidson, L. S. P. & Gulland, G. L. Pernicious anaemia.
London, Kimpton, 1930, 293 p.
- Delater, G. Les processus inflammatoires et tumoraux périodontaires.
Paris, "Semaine dentaire", 1929, 215 p.
- De Santis, D. Psicologia sperimentale.
Roma, Stock, 1929, v. 1.
- Fachkrankenhäuser, bearb. von K. Biesalski [et al].
Berlin, Springer, 1930, 266 p.
- Fellner, W. Das amerikanische Alkoholverbot vom Standpunkte der Volkswirtschaftslehre.
Berlin, Christian, [1929], 135 p.
- Fowler, (Sir) J. K. The sthenics.
London, Macmillan, 1930, 81 p.
- Fraser, A. J. Trauma, disease, compensation.
Phil., Davis, 1930, 524 p.
- Gellhorn, G. Gynecology for nurses.
Phil., Saunders, 1930, 275 p.
- Gordon-Taylor, G. The dramatic in surgery.
Bristol, Wright, 1930, 88 p.

- Greve, H. C. Aphorismen zur Kulturgeschichte der Zahnheilkunde.
Leipzig, Thieme, 1930, 91 p.
- Guy, J. & Linklater, G. J. I. Hygiene for nurses.
Edin., Livingstone, 1930, 211 p.
- Hankin, H. Common sense and its cultivation.
London, Kegan Paul, 1928, 289 p.
- Haworth, W. N. The constitution of sugars.
London, Arnold, 1929, 100 p.
- Héraux, A. Les broncho-pneumonies chez l'enfant.
Paris, Masson, 1929, 122 p.
- Hermant, P. & Boomans, D. La médecine populaire.
Bruxelles, Peeters, [1929], 240 p.
- Hertzler, A. E. & Chesky, V. E. Minor surgery. 2. ed.
St. Louis, Mosby, 1930, 602 p.
- Hess, W. R. Die Regulierung des Blutkreislaufes.
Leipzig, Thieme, 1930, 162 p.
- Heymans, C. Le sinus carotidiens.
Louvain, Secretariat de la Revue, 1929, 121 p.
- Kisch, E. Medizin, Gymnastik und Pädagogik im Kampfe gegen die Tuberkulose.
Leipzig, Thieme, 1930, 83 p.
- Mackenzie, (Sir) C. The action of muscles. 2. ed.
N. Y., Hoeber, 1930, 288 p.
- Marriott, W. M. Infant nutrition.
St. Louis, Mosby, 1930, 375 p.
- Marsat, L. & Marsat, A. Pathologie et thérapeutique appliquées à la chirurgie dentaire.
Rouen, La Vicomte, 1929, 86 p.
- Matheson, R. A handbook of the mosquitoes of North America.
London, Baillière, [1929], 268 p.
- Matthias, P. E. Die Frau, ihr Körper und dessen Pflege durch die Gymnastik.
Berlin, Eigenbrödler, [1929], 243 p.
- May, C. H. & Worth, C. A manual of diseases of the eye. 6. ed.
London, Baillière, 1930, 475 p.
- Meyer, L. F. & Nassau, E. Die Säuglingsernährung.
München, Bergmann, 1930, 353 p.
- von Monakow, C. & Mourgue, R. Introduction biologique à l'étude de la neurologie et de la psychopathologie.
Paris, Alcan, 1928, 416 p.
- Monrad-Krohn, G. H. The clinical examination of the nervous system.
5. ed.
N. Y., Hoeber, 1930, 222 p.
- Mussio Fournier, J. C. Estudios clínica médica.
Montevideo, Barreiro, 1929, 347 p.
- Neumann, W. Die Klinik der Tuberkulose Erwachsener. 2. Aufl.
Wien, Springer, 1930, 484 p.

- v. Niessl-Mayendorf, E. Vom Lokalisationsproblem der artikulierten Sprache.
Leipzig, Barth, 1930, 186 p.
- Nissen, H. Practical massage and corrective exercises. 5. ed.
Phil., Davis, 1929, 271 p.
- Oddo, C. La médecine d'urgence. 6. ed.
Paris, Doin, 1929, 1029 p.
- de Otaola y Richter, J. M. Aborto, su tratamiento.
Madrid, Morata, 1927, 246 p.
- Pauchet, V. & Bécart, A. La transfusion du sang. 2. ed.
Paris, Doin, 1930, 168 p.
- Pear, T. H. The art of study.
London, Kegan Paul, 1930, 117 p.
- Pont, A. Précis des maladies des dents et de la bouche. 2. éd.
Paris, Doin, 1929, 798 p.
- Portmann, G. & Kistler, K. Les otites moyennes.
Paris, Masson, 1929, 211 p.
- Rector, F. L. Health and medical service in American prisons and reformatories.
N. Y., National society of penal information, 1929, 282 p.
- Riser. Le liquide céphalo-rachidien.
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London, Kegan Paul, 1930, 390 p.
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London, Williams, 1930, 158 p.
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Leipzig, Barth, 1930, 543 p.
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Berlin, Springer, 1930, 396 p.
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London, Baillière, 1930, 265 p.
- Speier, A. & Pinkus, G. Rezeptarium für Zahnheilkunde und Zahntechnik.
Berlin, Dentistischer Verlag, 1930, 695 p.
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[London], Southern Libraries, 1929, 88 p.
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Bern, Selbstverlag, 1929, 2 v.
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London, Methuen, [1930], 204 p.
- Szondi, L. Die Revision des Neurastheniefrage.
Budapest, Novak, 1930, 150 p.
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St. Louis, Lister, 1930, 512 p.

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- Voronoff, S. & Alexandrescu, G. Testicular grafting from ape to man.
[London], Brentano, [1930], 125 p.
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- Yellowlees, D. Psychology's defence of the faith.
London, Student Christian movement pr. [1930], 190 p.
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DEATHS OF FELLOWS OF THE ACADEMY

GORDON KIMBALL DICKINSON, M.D., 280 Montgomery Street, Jersey City, N. J., graduated in medicine from the Bellevue Hospital Medical College, New York City, in 1877; elected a Fellow of the Academy May 6, 1897; died, June 25, 1930. Dr. Dickinson was a Fellow of the American Medical Association, American College of Surgeons, North Hudson Medical Society, Essex County Anatomical and Pathological Society, New York Medical Surgical Society, the Tri-Professional Society of New York City; American Medical Association of Vienna, the Practitioners, Macheon and Osler Clinical Clubs, the Medical Library Association, the William Pierson Memorial Association. Also President of the Hudson County Medical Society, the New Jersey State Medical Society, the Academy of Medicine of Northern New Jersey, the New Jersey Society of Surgeons, and of the American Association of Obstetricians and Gynecologists. Dr. Dickinson was also an honorary member of the Georgia Surgical Society and the Society of Railway Surgeons and the Society of the City of Greater New York.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

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EDITORIAL

NEWER SIDELIGHTS ON THE ANTIQUITY AND PROVENANCE OF INDIAN MEDICINE

Over against two imposing and venerable systems of ancient medicine—the Indian and the Chinese—question marks of considerable moment have been placed by modern scholars, queries respecting their origins, their uninterrupted development and the presumable extent of their antiquity. Thus, with reference to the proposition that China enjoyed an uninterrupted culture of 5000 years or more, Sudhoff sounds the challenge: “Really uninterrupted? Really uninfluenced? Two big queries which may be reinforced by a third: Is this cultural cycle after all so old?” “It must be admitted,” he goes on to say, “that answers to all three questions are very dubious.”

As to the antiquity and authentic character of Egyptian and Assyro-Babylonian medicine, there can be no manner of question. The papyri and the inscribed bricks not only tell their own honest story, but, in the case of the Egyptian medical documents, we are dealing with a late, decadent phase of culture, which seems actually to improve in quality as we go backward. The later Egyptian and Babylonian medicine which Herodotus described was the ultra-specialized, communal medicine which finds its analogues in our own time, and thus represents a comparatively recent development. The medicine of the papyric and cuneiform documents is the anonymous, collectivistic medicine of castes and guilds, which Sudhoff regards as pertaining to a very early and very low stage of development. Docu-

ments of this anonymous, overlaid, plagiarized quality are, in fact, very characteristic of the European medical literature, from the downfall of Rome to the invention of printing, a period of long painful gestation or re-birth, following the decadence and death of Graeco-Roman culture. Were the medical remains of Egypt and Babylon preceded, like those of mediæval Europe, by anything better? Given the slender shreds of evidence as yet available, our answers to these leading questions must remain vague and conjectural. In ancient Indian medicine, however, as exemplified in the Susruta and Charaka scriptures, we find a highly organized, highly specialized, highly rational body of medical doctrine, in quality equalled only by that of the Hippocratic Canon, and descended, as some proponents will have it, in a direct line from the Rig Veda and the Atharva Veda, (4000-1500 B. C.). But hear Sudhoff upon this matter:

"In the medicine of the Susruta, we encounter a highly organized system of scientific medicine as a tangible product of the Aryan intellect, comparable only with Greek medicine of the 5th century, B.C. As the first and oldest attempt to create an authentic science of medicine, it may well be assigned to the period of Vedic literature, yet is no more a product of it than was the medicine of Cos and Cnidos a creation of the priests of Asclepias. Hindu medicine, as we find it in the Atreya and Susruta, is like the Hippocratic medicine of Cos and Cnidos in one other respect, viz., both are associated with the tangible personalities of actual physicians, and are thus no longer the impersonal collective knowledge of guilds and castes, as was everything that preceded them. They have an individuality all their own. Behind them is sensed the great, thoughtful physician, who stamps them with the seal of his personality. The caste-lore of the Euphrates and the Nile, and to all appearance, of the Yangtse-Kiang and Hoang-Ho also, belongs in a much lower developmental stratum. The Atreya and Susruta stand upon a higher and more recent plane and presuppose the mental and observational activities of at least one or two thousand years preceding, even as the Hippocratic canon has for its long foreground the intellectual achievement of the Ionian nature-philosophers. In India, any significant advance over the Susruta is demonstrable only (to a very modest degree) in the work of Charaka, the contemporary of Galen. Susruta is, in round numbers, a hundred years older than Hippocrates, while Vagbhata, the latest of the compilers, belongs somewhere in the time of Paul of Ægina, which city was occupied by the Arabs, simultaneously with Alexandria.

in 643 A.D. . . . It may be asserted that the stages Egypt-Babylon-China and India-(China?) Greece, comprise the total medical achievement of the whole world, in a scientific and historic sense. The notion of China as a totally independent culture must be checked with a large question-mark."

What are the characteristics of Vedic medicine, contained in scriptures of vast antiquity and attributed to Brahma himself? The Ayur Veda is said to have comprised eight parts or *tantras*, viz.,

1. Surgery (foreign bodies, instrumentation, bandaging, surgical diseases);
2. Treatment of diseases of parts above the clavicle;
3. General diseases (internal medicine);
4. Psychiatry (Demoniacal diseases);
5. Pediatrics;
6. Toxicology;
7. Rejuvenation by chemical remedies and preventive medicine;
8. Treatment of impotence or, as others have it, racial hygiene.

But beyond these divisions, the authorities are somewhat evasive; our medical knowledge of the great text is at an end, and we are referred, for further information, to its commentators (Susruta, Charaka). In the Rig Veda, the great folk-hymnal of the nomadic Aryans of Northwestern India, women are apotheosized and equated with man as "rulers of the household;" beef and beer (*madza*, mead) from the *soma* plant (the *haoma* of the Zendavesta) are the common articles of diet, and physicians are mentioned as healers of disease. The basic physiologic principle in the Rig Veda is fire from heaven (*agni*). *Agni* has its seat in the heart, from whence it controls the act of vision and is the essence of the act of generation. In contradistinction to this heavenly fire, there is an evil or demonic fire which is the activating principle of disease (fever). Of diseases in particular and of special therapy, there is no mention. *Agni* is all.² In other words, we are here in the presence of the most primitive phase of scientific thought, in which an idea, symbol or principle is first apprehended as a tangible thing. The tenth book of the Rig Veda contains innumerable versified charms and spells and about 1350 of these are carried over into the Atharva Veda, the medical con-

² R. Müller: *Janus*, Leyden, 1929, XXXIII, 349.

tent of which is entirely made up of them: charms for personal welfare and long life (a leading motive in the Rig Veda), for birth of male offspring, for easy delivery of the child, against worms, against jaundice, fever, demoniac possession, against snake-bite, against sexual impotence, and so on. And along with all this, imprecations and evil spells casting fell diseases, fatal wounds or death by snake-bite upon enemies. Here then, as in all the Vedas, we have the two initial phases of the most primitive type of medicine: the mass of the people as a credulous, superstitious child, with some faint signs of individualistic thought in the *agni* principle (animal heat). By comparison with the plain and sensible rules of personal hygiene in the more ancient Laws of Manu, there is nothing of consequence. As in all medical documents of great antiquity, the personal and public hygiene is better than the medicine.

What of Indian medicine as we find it in the two great texts on surgery and internal medicine, the *Susruta* and the *Charaka Samhita*? As we now know it, the *Susruta*, like the total Hippocratic Canon or the Salernitan Regimen in its final state, is an *édition définitive* of many vanished antipenultimate editions, the end result of a long process of fusion of tradition and novelty, with much interwoven and superadded material. On the strength of a reference in it to a single verse of the Atharva Veda (which may have been interpolated), it has been allocated by some enthusiasts to the period 4000-1500 B. C. which, as Sudhoff shrewdly observes, is like attributing the Hippocratic Canon to the priests of the Epidaurian temples. In its final state, the material is of rare but unequal quality. The anatomy, like all Oriental anatomy, is poor: 300 bones, 800 ligaments, 500 muscles, 300 veins; but as in the Smith Papyrus, there are a few good descriptions of individual bones. The physiology is aëro-humoral, based upon air, phlegm and bile and there is a minute Cnidian classification of diseases into 1120 varieties, each, as Neuburger says "a vague symptom-complex which, upon

the slightest deviation from its supposed norm, dissolves to reappear in a number of fresh categories." But the materia medica is singularly rich and valuable and the operative surgery, including the use of some 121 instruments with unique modes of instruction, represents the highest reach of the subject in antiquity. The general pediatric canon (infant hygiene) is certainly not surpassed by anything else of the kind in its period. In keeping with the terrain, there appears, for the first time, an exhaustive consideration of toxicology, including varieties of poisonous snakes, the effect of their venoms and the antidotes therefor. All in all, a singular mixture of superstition and common sense, traditional and superadded rational elements. Charms and superstitious practices go hand in hand with sensible rules and prescriptions, a purely conjectural list of innumerable, unimaginable parts of the body alongside of surgery of an advanced type, a Cnidian subdivision of multifarious diseases with a rich, multiform but fairly rationalized materia medica and therapeutics. Our well founded esteem for Indian medicine is based upon an assemblage of very real values, derived from the most scattered, and disparate sources, *viz.*,

A sensible scheme of vegetarian dietetics, bathing, clothing, respiratory gymnastics, domestic and personal hygiene and self-purification (*Laws of Manu*), analogous to the codes of tropical hygiene in the Old Testament or the Avesta and Vendidad of Persia; an exhaustive consideration of different fibres and materials for cleaning the teeth (*Institutes of Vishnu*); the employment of human inoculation against smallpox (*Sacteya*); the semeiology of cholera, dysentery, leprosy, malarial fever and diabetes (*Susruta, Charaka*); the localization of bubonic plague in rats (*Bhagavata Purana*); the knowledge of "honey-urine" in diabetes and of the purgative effect of honey (the "sugar diarrhœa" of Orgler) in newborn infants; a highly organized scheme of materia medica, operative surgery and infant hygiene; the use of mosquito-netting; knowledge of hypnotism and of the narcotic effects of hyoseyamus and *Cannabis indica*; knowledge of aphrodisiacs, poisons and venoms of poisonous snakes and their antidotes; mosquitoes as vectors of malarial fever (*Susruta*); the new feature of veterinary medicine.

Rudolf Hoernle assigns the *Susruta* to the 6th century, B. C. (a hundred years before Hippocrates), the *Samhita* of *Charaka* to the time of Galen (2nd century, B. C.) and

the Vaghabata to the time of Paul of Ægina (7th century, A. D.). To this arrangement, no exception need be taken if we assume the Susruta, as we now know it, to be the final state or end-result of some rudimentary ancestor dating back to the century before Hippocrates. As far as foreground is concerned, the initial or anterior phases of the Hippocratic Canon itself might well be assigned to the 6th century, B. C. But, in the light of recent research, the attribution of a remote antiquity to Indian medicine as presented in accessible texts, maintained, as it is, by so many enthusiasts,³ may well give us pause, and for the following reasons.

About 557 B. C., Siddartha, whose family name was Gautama of the Sakya clan (Sakya Muni), was born at the foot of the Himalayas in northern Bengal and about 528 he deserted the pleasant ways of life and rode out into the moonlight to become the Buddha. But this great democratic religion could make no headway against the arrogance of Brahminism until after the invasion of Alexander the Great (326 B. C.), when the adventurer Chandragupta, who expelled the Macedonians and founded the Maurya dynasty (315), took it up as a weapon in his own conflict with the Brahmins. Through his son Bindasara (291-263), who conquered the Madras area, and his grandson, Asoka (263-221), whose conquests extended to Afghanistan, Buddhism spread all over India, and eventually reached China and Japan *viâ* Afghanistan and Turkestan. By the third Buddhist Council (242 B. C.), missionaries were sent out to Gandhara, near Peshawur in the Punjab (N. W. India), and there the Hellenic culture brought in by Alexander came into contact and ultimate fusion with the Northern Hindu culture. Not only was Greek art scattered all over Western Asia by the stranded minions of Alexander, so that we find Ganymedes in Gandhara and Thibet and Nike figures in Bustan and Kyzil, but the

³ For example, in a recent article in the *Indian Med. Record*, Calcutta, 1929, XLIX, 289-299.

endless stone images of the Buddha, which now multiplied all over Asia, Ceylon, Japan and Java, are almost invariably of Hellenistic type, calm, immobilized, expressionless, of immortal repose and "unblamed serenity." The autochthonous or native art of India, on the other hand, is intensely modern in its passion for movement, realism, expressionism, eroticism, solidity of form in painting and leanings to the grotesque on occasion. Nothing could be less like the serene Graeco-Buddhist sculptures of Gandhara, Kutscha or Turfan than the voluptuous images on the Sanchi gates or the colorful erotic mural paintings in the Ajanta caves.⁴ Between the two extremes are innumerable hybrids and subvarieties, common to the atlases of Griffiths, Foucher,⁵ Le Coq and Grünwedel.

Now this fusion of Hellenic and Hindu art in the Punjab, in the 3rd century, B. C., is the virtual starting point of recent revaluations in the chronology of Indian medicine. To begin with the hospitals for men and animals which, it is said, King Asoka established everywhere during his beneficent reign, along with the planting of trees and gardens, and the sinking of wells. A recent exegesis of the second carved inscription of King Asoka and subsequent sources, by Dr. Reinhold Müller,⁶ goes to show that our modern concept of the term "hospital" has been read into the various expressions employed, which are found to mean religious retreats, asylums or resting places, refectories or free hotels, medical-supply stations or storehouses for remedies (usually dietetic), designed by royalty for the innumerable strolling pilgrims of the Buddhist cult, rather than as institutions for the reception, isolation, nursing and treatment of the sick and wounded alone. They were thus more nearly like the night-asylums of the Russians, the sanctuary retreats and charitable

⁴ J. Griffiths: *The Paintings in the Buddhist Cave-Temples of Ajantā* 2v. London, 1896.

⁵ A. Foucher: *L'art gréco-bouddhique du Gandhara*. 2v. Paris, 1905-22.

⁶ Müller: *Arch. f. Gesch. d. Med.*, Leipz., 1930, XXIII, 135-151.

food-kitchens of the Middle Ages or the subsequent granaries and storehouses against famine than the military hospitals of the Romans or the later hospitals of Christianity and Islam. Even the superstitious temple-cult of the Asclepieia of Cos, Cnidos, Epidauros and Pergamos, or the Isieia of Alexandria, was more exclusively medical in tendency, if not in character. The clientèle of these Buddhist retreats, moreover, comprised the whole vagrant swarm of pilgrims, monks, paupers, infirm or destitute women, children and old people and only incidentally the wandering sick or wounded. Such foundations, in fact, were merely designed for temporary use, in conformity with one of the fundamental tenets of authentic Buddhism, constant motion and migration of its votaries, except during unfavorable weather. They were charitable foundations of royalty and with their inception physicians themselves had nothing to do. True, the earlier xenodochia and nosocomia of Western Europe were hostelries and caravanseries of this type and Sudhoff's criterion of a hospital is the systematic treatment and cure of disease within its walls. But it seems hardly probable that this end was attained in India in the 3rd century, B. C. The nearest thing to it, in the citations sifted by Müller, is a recital by the Jainist monk, Jinakirti, in the 15th century, A. D.

Again, the coexistence in Rome of the superstitious Æsculapian cult (serpent-worship) with rational practice by Greek physicians points to many parallels, suggesting that Indian medicine probably travelled the same weary road of trial and error, of superstition set off by occasional common sense, which was the lot of European medicine during the selfsame stretches of time. The association of the serpent with supernatural powers, including the infliction, averting and healing of disease, is noticeable or, at least, inferential, in the case of certain carved caducei from the prehistoric caverns, the caduceus symbol on the steatite Babylonian vase in the Louvre (3000 B. C.) and its implications, the *uraeus* or cobra symbol surmounting the crest of the Egyptians gods, the seven-headed cobra

which forms the nimbus of the *nagas* or cobra-gods of India, the apparent cobra symbol on the Maya carvings, the Greek myth of the Gorgon head and the gigantic pythons on the votive tablets of Zeus Meilichios (the deified *Æsculapius* in serpent form). In Chinese and Japanese mythology, these serpents merge into dragons. The evolution of therapeutics, or even semeiology, from early common sense observations and experiments on dietetics (as elucidated in Hippocrates on Ancient Medicine) was common to Asia as well as Europe, and, as hinted by Müller, the materia medica and therapy of ancient India were mainly dietetic in the first instance, as in Greece. It is not unreasonable to infer, therefore, that the rational pediatrics and surgery of the *Susruta* was possibly an overlaid product of diffusion of culture, probably contemporaneous with the pediatrics of Soranus of Ephesus and the surgery in Celsus. If some of the extensive Indian materia medica was borrowed by Dioscorides and Pliny, it is equally probable that some of it may have been imported by travellers from Greece and Persia. In *Sino-Iranica* (Chicago, 1919), Berthold Laufer shows that a goodly number of Chinese plants, drugs, fruits, food-products, woods, minerals, precious stones and textiles were imported from Persia into China (the greatest botanic garden in the world) by the diffusional process. The excavations made by Le Coq and Grünwedel in Chinese Turkestan during 1902-14⁷ reveal the pathway by which Graeco-Buddhistic sculpture, inferentially other phases of Hellenistic and Iranian culture, migrated into Mongolia, Thibet, China, Burma, Siam and Japan. The archæologic findings of the four Turfan expeditions cover four

⁷ A. von Le Coq: *Die Buddhistische Spätantike in Mittelasien*. I-V fol. Berlin, 1922-4. A. Grünwedel: *Alt-Buddhistische Kultstätten in Chinesisch-Turkestan*. 8: Berlin, 1912. *Alt-Kutscha*, Berlin, 1920. *Buddhistische Kunst in Indien*. 2. Aufl. Berlin, 1920.

great back-and-forth migrations of culture between Asia and Europe, *viz.*,

1. A wandering of Scythian nomads from the west over Asia in pre-Christian times, usually over the grassy, well-watered plains north of Tienschow, where innumerable mortuary tumuli are found, surmounted by rude stone images of the "*baba yaga*" type existing in Southern Russia and the Crimea, and known by the same Turkish name (*kurgan*, fort). One detail of these South Russian sculptures, *viz.*, a cord attached to the belt to keep the boots on straight, is also common to the blue-eyed, red-haired men of the mural paintings of Turfan. These Le Coq identifies with the Tocharians, an Indo-Germanic tribe of bowmen on horse-back, who conquered Western China as far as the Hoang-Ho in the 3rd century, B.C., but encountering the first westward Turco-Mongol migration, were defeated in a terrible battle about 176 B.C. and driven back westward to the Hellenistic areas of North-eastern Iranistan. This latter event corresponds with the historic irruption of Indo-Scythians into Persia and India (130 B.C.). Recent Russian excavations in Mongolia have unearthed Scythian (bronze-age) antiquities and Hellenistic textiles of similar provenance (2nd century, B.C.). Not only Greek and Persian, but even Egyptian and Mesopotamian cultural elements may have got into China through these northern migrations.

2. The conquest of Iran and the Punjab by Alexander the Great (336 B.C.) and its consequences, *viz.*, inmixture of Hellenes and Macedonians with the native populations; foundations of the Graeco-Bactrian and Graeco-Parthian kingdoms; conquest of these areas by the Scythians or Tocharians (130-126 B.C.), who, as in Lapouge's law, were, in turn, assimilated to the Greek culture of the conquered peoples. In this way there came about a vast Hellenization of India and China, particularly by the spread of Buddhism over Asia *viâ* Gandhara (242 B.C.-639 A.D.), where Hellenic and Indian culture collided and interfused.

3. The westward migrations of Huns, Goths, Visigoths and Vandals into Europe and the further interfusion of Eastern and Western culture by the spread of Islam and the Crusades.

4. The great Mongol invasions (1214-42), which extended as far westward as Liegnitz (Lower Silesia) and left indelible marks upon Eastern Europe and Russia, even to the faces of some of the population. The Mongols, Le Coq opines, may have brought into Europe the idea of printing with moveable types and certainly that of a postal service over vast distances by relaying of couriers and horses. This device, he says, brought China nearer to Europe than ever before, indeed, up to the advent of the Siberian Railroad and the *aéroplane*.^s

The findings of the four expeditions are of exceptional

^s A. von Le Coq: *Auf Hellas Spuren in Ostturkistan*. Leipzig, 1926.

interest and completely pulverize the notion that the unique cultures of India and China were isolated, independent developments.⁹ In Eastern Turkestan, all the transition stages between temples of Hellenistic type and those of ultimately Chinese (pagoda) character are discoverable and kinship with the latter is seen in the mountain-like terraced plinths and Babel-like stupas of India. Le Coq even affirms that wherever an antique culture encounters a strange religion, it engenders a new kind of art. The survivals of Hellenistic art in Asia, most of them long buried under the accumulated dust of centuries, include:

1. Replicas of the Ganymede group of Leochares in India, Turkestan and Thibet, with change of the androgynous Ganymede figure into a woman. 2. Nike-figures in Egypt, India, Persia, Turkestan, China and Japan. 3. Changes of the antique Horn of Plenty (cornucopia) into a redundant blossom (Turkestan, China). 4. Thrones for the Buddha flanked by lions of Mycenæan type (India). 5. Helmets with animal heads on Bactrian coins and on Chinese and Japanese images. 6. Smoking lamps (Turkestan, Japan). Evidences of later transmissions and interchanges are: 1. The mediæval armor and costumes of the European age of chivalry on Tocharian men and women and identity of the slashed military jacket of the Sassanids with the Polish *ulanka*, which is not unlike the migration of Russian goloshes, the short skirts of European peasant women and the dances of the jungle to America. 2. Heavy cross-handled swords and peculiar helmets of crusaders in mural paintings of Kutscha. 3. Dragon-flags of Mongol type (Kutscha) in the Bayeux tapestry. 4. Coffins ornamented with heads and tails of dragons used for ancient Germanic warriors and for the Buddha (Kyzil).¹⁰ In addition we need only mention the late Buddhistic character of early Florentine painting (immobilized Madonna) or that impressive passage from Huc's *Travels* in Tartary, Thibet and China, cited by Wells in his *Outline of History*: "The cross, the mitre, the dalmatica, the cope, which the Grand Lamas wear on their journeys, or, when they are performing some ceremony out of the temple; the service with double choirs, the psalmody, the exorcisms, the censer, suspended from five chains, which you can open or close at pleasure; the benedictions given by the Lamas by

⁹ Let mention be made here of the highly original achievements of Hindu mathematicians, of whom the late Srinivasa Ramanujan was the subject of special enconium in *Proc. Roy. Soc. Lond.*, Ser. A, 1921, xcix, pp. XIII-XXIX.

¹⁰ Le Coq: *op cit.*, *passim*.

extending the right hand over the heads of the faithful; the chaplet, ecclesiastical celibacy, spiritual retirement, the worship of the saints, the fasts, the processions, the litanies, the holy water, all these are analogies between the Buddhists and ourselves." 11

Controversy between protagonists of the convergence and convection (diffusion) theories of the origins of ethnic culture has been maintained with vigor since the first statement of the doctrine of spontaneous origins by Adolf Bastian (1881) and of the mechanical transmission of culture by Friedrich Ratzel (1882), and about all this hinges the question of the remote origin and independent development of Indian medicine. While it is plain that both have strong elements of truth and probability, it seems evident that certain basic or elementary ideas (*Elementargedanken*), concerned with the fundamental instincts of self-preservation and reproduction, have been common to the human species throughout space and without reference to time. We need only consider the immense importance attached to earth, air, fire and water, numbers, the stars and planets, the generative apparatus, the breath (*pneuma*), the blood and other humors of the body in all systems of ancient medicine. On the other hand, ethnic cults, practices and inventions are obviously spread by convection from country to country (jazz in Europe and the far East, kimonos and samovars in America) and illustrate Cardinal Newman's famous dictum that mankind at large are more apt to follow types and prevailing fashions than arguments and ideas. In our large cities, skyscrapers coexist with buildings that look like Greek temples and wherever a particular race is massed in sufficient numbers, its cult-practices obtain. Zoroaster, Buddha, Confucius, Thales and Pythagoras sprang into being along the 35th parallel of North latitude in about the same period of time (6th century, B. C.). Perhaps the solution of the whole matter is implicit in Huxley's observation

that this very period was activated by "some powerful mental ferment over the whole of the area comprised between the Ægean and Northern Hindustan," one of the most brilliant guesses that Huxley ever made, and pointing to remoter origins of all these cultures in Egypt and Babylon.

F. H. GARRISON

THE NONVALVULAR DISEASES OF THE HEART IN MIDDLE LIFE

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Until a few years ago tuberculosis headed the list of causes of death but persistent education of the people, a better economic life, and probably other factors, have reduced the mortality to half or even less. In Philadelphia for example the death rate from tuberculosis was:

In 1909	187.3	per 100,000 population.
In 1919	142.7	per 100,000 “
In 1929	69.34	per 100,000 “

The questionable honor of standing at the head of the list now belongs to heart disease. In every large city of the country the death rate from this cause is rising both relatively and absolutely so that to-day heart disease is apparently firmly emplaced as the leading cause of death. Reports for 1928 from certain states with an aggregate population of about 25,000,000 show that 228 persons out of every 100,000 died from heart disease as compared with 106 from kidney disease, 105 from cancer, and 100 from pneumonia.

For Philadelphia the death rate from heart disease was:

In 1900	128	per 100,000 population.
In 1909	167.8	per 100,000 “
In 1919	190.4	per 100,000 “
In 1929	211.14	per 100,000 “

In the year 1926 it reached the extraordinary figure of 295.7.

In the age period from 40 to 50 the figures were:

For 1909	321 per 100,000 population.
For 1919	393 per 100,000 “
For 1929	441 per 100,000 “

And from 50 to 60:

In 1909	441 per 100,000 population.
In 1919	601 per 100,000 “
In 1929	823 per 100,000 “

The recently published statistics of the Metropolitan Life Insurance Company likewise prove the growing menace of death from heart disease especially in the adult periods of life.

All these figures must fall far short of the real facts for they take no account of the many deaths in pneumonia, diphtheria, and after operations that are actually due to failure of the heart but are recorded as deaths from the more obvious cause. We must of course not carry the argument too far for in the last analysis everybody dies because the heart stops. I am referring only to those cases in which death was due to the failure of a heart worn out before its time.

It is true that some disease must be first as the cause of death but suppose it were typhoid fever or malaria or hookworm. We as a profession should feel distressed and ashamed since there are available methods of controlling these diseases and there could be no excuses for failing to put these methods into practice. What about heart disease? Unfortunately the problem here is incomparably more difficult. The causes are manifold, and often entirely elude us, and without a knowledge of causes no problem can be successfully attacked. However I see light dawning in two directions—in the direction of rheumatic fever and in that of syphilis.

It is difficult to determine the quantitative value of the syphilitic factor but certainly among the adult male population infected with lues a large number die of heart dis-

ease in the prime of life. Of rheumatic fever and its variants including chorea we know much more, largely through the work of St. Lawrence, Swift, and others, for it takes its toll in childhood and adolescence, a section of the population that can be investigated and studied during school life.

It has been shown that the incidence of certain infections and rheumatic diseases in association with damaged hearts is very high—scarlet fever in 12 per cent., diphtheria in 16 per cent., chorea in 15 per cent., rheumatism in 44 per cent., and tonsillitis in 66 per cent. of the cases.

That much can be done in preventing rheumatic heart disease is indisputable—any lagging in our efforts is due to the fact that the profession as a whole is not sufficiently aware of the importance of rheumatism in the causation of heart disease and of the means of combatting it. Systematic health examinations, removal of diseased tonsils, improvement in domiciliary and community hygiene, regulation of diet go far toward lessening the ravages of this disease. Only recently I showed to my students a girl of 13 of Italian parentage who had advanced aortic and mitral valve disease of rheumatic origin. The child had obviously diseased tonsils and enlarged lymph glands in the neck. The students asked me whether I advised removal of the tonsils. My reply was that while it was like shutting the stable door after the horse was stolen, inasmuch as the large glands in the neck were indicative of continuing infection, I should advise tonsillectomy. The operation was done under general anesthesia and passed off without difficulty.

Early diagnosis by the physician of the existence of some form of rheumatic infection is of great importance in prevention. Perhaps we shall still further minimize the danger of rheumatic fever, a truly terrible specter of childhood, by specific vaccines and by better understanding of the predisposing causes. This whole subject is a big and worthwhile field for the sanitarian and the family doctor.

But there are other forms of heart disease—and when I use the term heart disease I really mean diseases of the circulation—of the causes of which we have little definite knowledge, and the symptoms of which are often so insidious that when we come to recognize their meaning, it may be too late to do much good.

I want to speak especially about those more obscure forms of heart disease that are not due to rheumatism or to syphilis, for not only are they very common but they are the ones that are chiefly to blame for the heart failure in middle life.

Perhaps at this point some of the older persons present might ask what I mean by middle life. When I was a student in the medical school my professors, some scarce 40 years of age, looked to me as old and venerable men. Such is perennially the view of youth. This was brought home to me in an uncomfortable way a short time ago. A student presenting a case before my class began, "Mr. X is a middle-aged man of 40." My heart sank within me. Does middle life begin at 40 or at 50 or, as I like to think, at 55 or 60, partly with reference to the fact that the average span of life has been prolonged to about the age of 56? Women surely are pushing the date farther and farther onward—in dress, in general activity, even in the onset of the menopause. The women of to-day at 50 are much younger than their mothers were at the same period. Perhaps instead of taking a particular year, middle life should be dated from a time when a change in function manifests itself from which a beginning wearing down of the machinery can be definitely inferred. Middle life is thus rather a physiologic than chronologic period.

The disease of the heart responsible for so many cases of physical breakdown in the period of active life rarely affects the valves—it is as Christian has well called it non-valvular disease. The causes are obscure. They can only be discovered if we make it a practice to take a searching

history in every case of disease that comes to our ken. Such a history combined with the proper clinical and if the opportunity offers pathologic study will eventually yield the needed thread of Ariadne. Not only is the history at the moment important but also the Mackenzian method of continuous record of all morbid conditions even the most trivial.

On the basis of our present knowledge the following statements may be made:

1. A certain proportion of cases is due to latent syphilis. Until recently it was generally held that lues attacks the aortic valves and the aorta chiefly but the studies of Warthin show that syphilis may attack the heart wall and that it may be responsible for sudden death which without a careful investigation might be attributed to a coronary accident.

2. Chronic focal infection is in all probability responsible for many cases of myocardial disease. At times the evidence is clear and incontrovertible, at others it is only presumptive, and in still others there is nothing to support it but dangerous analogy. The Germans have been more or less unwilling to accept the American, I ought to say perhaps, the Chicago-Rochester point of view but they have not offered us a countervailing theory. Personally, I am a follower of Billings and at a somewhat greater distance of Rosenow of the Mayo Clinic.

As a Philadelphian it is but fair that I should make it known to any that may be unaware of it that Benjamin Rush had a very good idea of the importance of focal infection. In one of his letters, dated I think 1803, he speaks of the possible systemic diseases resulting from abscesses of the teeth, and even Rush had a precursor in the great French surgeon Pettit.

The focal infection can be in any one of the familiar places but I should like especially to indict the gall bladder. I have seen several instances in which cardiac symp-

toms of great severity were entirely abolished by removal of a diseased stone-bearing gall bladder.

Sometimes the physician is afraid to operate in such cases considering the myocardial disease a positive contra-indication. I am inclined to think that if the patient is otherwise a reasonably good risk then the cardiac disease is not a contra-indication but the very opposite, an indication to remove the gall bladder.

The tonsils, the teeth, the sinuses, the genito-urinary tract are also more or less important as possible foci of infection. From time to time I have wondered whether fibroid tumors per se can cause myocardial disease. Lynch in a recent number of the *Journal of the American Medical Association* expressed the opinion that they by themselves are not responsible for myocardial disease.

Is failure to obtain improvement by removal of an infected focus proof of its non-importance? I hardly think so. A few days ago the ceiling in my sitting room was ruined by an over-flow of water in the bathroom above. After the plumber has repaired the defect in the bathroom the ceiling damage still remains but it may not get worse.

3. Infectious diseases whether in childhood or later may lay the foundation for subsequent myocardial or coronary disease. I have wondered whether the apparent increase in coronary disease might not hark back to the influenza epidemics of recent years.

4. But there are other factors beside focal infection that have to be considered—those indefinable conditions that cause what Clifford Allbutt designated as Hyperpiesia. Overeating is one of them. It is curious how many persons scout the idea that they eat too much. "Why doctor, I hardly take anything for breakfast and my lunch consists of a sandwich and a glass of milk." When one goes into detail one finds that the evening meal is easily equivalent to two square meals, in fact it may be two meals squared.

5. What part if any the lack of vitamins or their improper balance may play in the production of degenerative diseases is altogether a terra incognita.

6. Tobacco when used in excess is to my mind a cardiac poison. While it may not always act in that manner, I am quite convinced that in patients who have had cardiac attacks, especially of coronary or anginal type, it acts as a harmful agent. Alcohol is less important; I doubt if by itself when taken in moderation, it produces the myocardial degeneration of middle life.

7. But more important than any of the causes named are the general mode and habits of life. Overweening ambition with all it implies in striving and neglect of self is an outstanding factor in the history of an ever-increasing number. In our own profession the ambition may reveal itself only as an excessive devotion to duty or it may be combined with a desire to provide well for the family. In any event it leads to irregularity of meals, to inadequate sleep, not rarely to a passionate affection for My Lady Nicotine.

Since the various exciting causes I have enumerated are operative upon a large part of our adult population in the mid-period of life, the question arises why do they not all succumb to myocardial or cardiovascular disease? The answer is to be found in the word heredity. The medical pendulum swings back and forth in long sweeps—for several decades it hovered around environment but now it is slowly swinging back toward the constitution which implies the hereditary factors. The constitutional aspect of disease is certainly important but the subject is not one upon which I want to dilate at the present time. Suffice it to say that the majority of chronic diseases arise upon a prepared basis which explains why many of these diseases are familial. In the case of myocardial disease the familial tendency need not express itself in identical ways in all the members of a given family. Apoplexy may kill one, angina pectoris or coronary occlusion another, myo-

cardial disease a third, arterio-sclerotic nephritis a fourth. Though seemingly different there is a unifying factor in all of them which is evidently readily transmitted by heredity.

I have just said that the constitutional factor is important in chronic diseases. There are many reasons for believing that it is equally important in acute infectious diseases. I well remember two families of my acquaintance living in the same section of Philadelphia during the typhoid era in the city. In the one family there were a number of cases of typhoid fever, some seemingly had a second attack. In the other there was not a single case of typhoid fever although they like the other family drank the same contaminated water. It is but the old idea of the soil.

Emphysema is very apt to lead to an eventual weakening of the myocardium with all the attendant signs and symptoms of congestive heart failure.

The goiter heart stands in a class by itself. I need not say much about it except to call attention to one fact pointed out by Lahey of Boston and others that sometimes the goiter condition is not very evident, and the real cause of the myocardial disease and of its failure to respond to the usual treatment is overlooked. Hence the advisability in certain obscure cases of myocardial failure of making a basal metabolism test.

I need not dwell long on the pathology of "medieval" myocardial failure. We usually find cardiac hypertrophy with degenerative changes, with fibrosis, scars from infarcts, etc. Often but not always the coronary arteries are diseased; sometimes the kidney or the brain exhibits arterial disease. The vessels of the eyes may or may not show sclerotic changes but whether healthy or not one cannot with certainty assume a corresponding condition of the cerebral vessels.

As I have said before the valves may not show any note-

worthy lesions although patches of sclerosis and dilatation of the mitral ring are not infrequent.

Symptomatology:

I have classified the early manifestations of myocardial weakness under four heads:—

- I. The respiratory.
- II. The digestive.
- III. The painful.
- IV. The oppressive.

I. The respiratory is the most common type and shows itself usually as a shortness of breath on effort, not rarely as a sudden paroxysm of air hunger coming on especially at night. There is a tendency on the part of the patient, sometimes on the part of the physician, to attribute the shortness of breath to lack of exercise, to obesity, or to indigestion, the last usually in those patients that complain much of gaseous distention. One should never make such a diagnosis in a man or woman of 50 years and over without a very careful consideration of the state of the heart and circulation.

Sometimes the myocardial patient has a racking cough quite out of proportion to the signs found in the lungs. In such patients the diagnosis of chronic bronchial asthma may be or even of whooping-cough is erroneously made.

II. The digestive type. This is one of the most important not so much because of its frequency as because of the possible grave errors in diagnosis. I have elsewhere called attention to the gastric masquerades of myocardial disease (*Journal of the American Medical Association*, November 17, 1928, Volume 91, 1521). In the milder cases gaseous distention and belching are the principal complaints. It is easy to see why such symptoms in the absence of striking cardiac changes on auscultation should lead to a diagnosis of gastritis or of nervous dyspepsia.

In the severer cases, as for example in coronary occlusion, the symptoms are frequently those of an acute ab-

dominal explosion, suggesting perforation of an ulcer or gall-stone colic. Even angina pectoris may give rise to symptoms difficult to distinguish from biliary attacks.

III. The painful type. The location of the pain, its intensity, the well-known *angor animi* are suggestive of cardiac disease. However, as I have just said, the pain may be referred to the epigastrium or to the right upper quadrant and thus simulate gastric, duodenal, or gall-bladder disease. Under the painful type I would include both angina pectoris and coronary thrombosis, the latter a disease of increasing frequency. Perhaps the increase in frequency is only apparent and is due to a better knowledge of the earmarks of the disease.

While speaking of the painful type I want to call attention to an important but neglected phase of the subject, namely this, while the pain may be the first thing to attract attention to the heart it can scarcely be looked upon as the beginning of disease. There must of necessity be a more or less prolonged incubative period, the early detection of which should be our aim. By following Sir James Mackenzie's advice already mentioned of studying and recording the beginnings of disease, by making careful routine physical examinations, and by using the electrocardiograph frequently, it may be possible to discover latent defects at a time when arrest of the disease is most easily achieved. I am quite certain that if we search carefully the history of cases of angina pectoris and of coronary occlusion we shall find that the patient has had attacks of oppression or of indigestion like those I have described. Such attacks often make no impression or if they do are thought not to be related to the heart.

IV. The oppressive type. It is a debatable question whether this constitutes a separate type. My justification for separating it from the others is that I have seen a goodly number of patients whose cases could not be otherwise classified. In a typical instance the patient complains that on walking he has a sense of oppression across the

upper or middle chest. On stopping for a moment the oppression passes off without any eructation of gas or any other symptoms referable to the stomach. The attack is most likely to come on if he starts walking directly after a meal or walks uphill against a strong wind. Though the trouble appears to be mild it yet involves the possibility of sudden death. English writers have called it *angina sine dolore* but there is no true *angor animi* nor is there in the early stages of the condition any radiation to the arms. Later on there may be such radiation but like the thoracic distress it is of a mild character.

Sudden death can occur in any of the four types of myocardial disease—I am speaking of their early manifestations—but it is least likely to occur in cases in which the respiratory symptoms dominate the picture.

The sudden death is often attributed to indigestion especially in the newspapers and the statement is not infrequently made that the patient had not complained of heart trouble before. It is my belief that with rare exceptions the patients had symptoms prior to the final catastrophe but that the symptoms were of the type I have described, the oppressive or the gastric, the true significance of which was not appreciated by the patient nor perhaps by the doctor if he consulted one.

It is for this reason that I want to call special attention to these early signs, gastric distress, mild attacks of pain, and a sense of oppression on effort. If these signs are properly understood not only will fewer persons die a journalistic death of acute indigestion but preventive treatment can be instituted at an earlier date.

Other symptoms of myocardial disease frequently overlooked are emaciation and subnormal temperature. The patient shows this emaciation most markedly about the neck so that the neck becomes scrawny and the collar stands out. There is also a tendency to fatigue and a general lack of both mental and physical endurance. Not rarely these symptoms are associated with a change in

temperament, the patient becoming irritable and morose.

Diagnosis: From what I have said before it is evident that myocardial disease is an insidious thing and that our efforts should be bent upon discovering it, as it were, in the making. The text books usually describe a fully developed disease with congestive heart failure, etc.

The following objective criteria are helpful in the diagnosis of myocardial disease: Perhaps the commonest is an increase in the size of the heart. This can be easily determined in a majority of instances by inspection and palpation, especially the latter. The physician must, however, make it a practice to place the hand back into the axillary space as the apex beat is sometimes far out even though an impulse can be felt in the normal situation.

The X-ray is naturally useful when the size of the heart is in doubt.

Auscultation quite often leaves us in the lurch for the reason that in the majority of cases of myocardial disease in middle life there is no murmur, and for many physicians the absence of a murmur when the rhythm is regular spells a normal heart. One of the best lessons I have had enforced upon me in my service in a large municipal hospital has been the frequency with which even in advanced cases of myocardial disease with congestive heart failure a murmur is absent. That this is true of angina pectoris cases is too well-known to need emphasis. Unless a patient has had rheumatic fever or syphilis we need not expect to find a murmur. Murmurs may be present but they are not of real significance as far as the diagnosis is concerned.

While a normal rhythm and reasonably good heart sounds may exist despite the presence of myocardial disease, quite frequently there is a change both in rhythm and in quality of the sounds. A common change in the former is the occurrence of a gallop rhythm—a gallop rhythm of the anapest type which gives to the ear the impression of a reduplication of the first heart sound. At

times there is arrhythmia, extrasystolic or fibrillary, the former being more common. As a rule such extrasystoles are not very significant as they may disappear with a little rest or on the removal of some focus of infection or after regulating the diet so as to lessen gas formation. In other words one would not conclude from the presence of extrasystolic arrhythmia alone that there was organic myocardial disease.

The heart sounds themselves may undergo a change in quality which is rather subtle and can be depended upon only in marked cases. The principal change is a softening or muffling of the first sound at the apex or of all the sounds at all the valve points. The lungs may show basal râles or small pleural effusion.

Blood Pressure: There is no characteristic blood pressure in the myocardial disease of middle life. Perhaps in the majority of cases it is elevated, in some it is normal, in others it is low. A precipitous fall is found very generally in coronary thrombosis. A considerable fall in an individual who has no pain, but has had the digestive or oppressive type of symptoms, is a sign of grave significance.

The *electrocardiograph* is a valuable instrument in revealing the existence of myocardial disease. It may merely confirm what clinical investigation has already revealed but there are border line cases in which the instrument is exceedingly helpful. It must, however, be remembered that the electrocardiogram is sometimes normal despite the presence of serious myocardial disease; in such cases clinical intuition is the better guide.

Treatment: Myocardial disease of middle life being an insidious degenerative process our objective as physicians should be primarily to find out what brings about or initiates the degeneration. This as I have indicated is difficult but can perhaps be accomplished in time if during our health examinations we are thorough and keep careful records. Eventually, though perhaps not for several gener-

ations, the professional mind may recognize the earliest signs of these degenerative processes and then medical men, our successors, will be able to institute prophylactic treatment in good time.

Whether eugenic principles will ever sufficiently influence sexual selection in man to favor a totally untainted off-spring is a question that cannot be discussed with any profit at this time.

For the present we shall have to content ourselves with instituting whatever protective measures are feasible and reasonable when the disease is established and to treat symptoms as and when they arise. It is wise to take account of the family history however, and if it indicates any weakness of the heart or circulation an attempt should be made to regulate the man's or woman's life in such a way as to conserve the integrity of the cardiovascular system.

Search should be made for foci of infection and the removal attempted if it does not entail any undue risk and if it is possible to show a reasonable connection between the infection and the cardiovascular malady. The importance of periodic examinations in persons who have shown evidences of disease of the heart must be emphasized so that the man or woman will submit to a periodic overhauling even if there are no warning symptoms. As guardians of the public's health it is our duty to impress upon the people the wisdom of spending money for such an examination.

Actual Treatment: In all of the four types of myocardial disease a period of rest is advisable, in fact usually imperative.

In the case of coronary disease four weeks is the irreducible minimum for this period of rest. The rest must not only be physical but must also be mental.

With respect to diet no hard and fast rules can or should be laid down. It is of importance to make the meals small

and simple, especially the evening meal. In general the kind of food is a matter of less moment. However, pastry, fried foods, fresh breads, condiments, tea and coffee should be avoided.

One of the great annoyances of patients with cardiovascular disease is gas. While this often is swallowed air, it may be in part or sometimes wholly due to fermentation. It is therefore desirable to avoid such food as might create gas. I have found that there was at times more gaseous distention after fluids than after solid or semisolid foods; I therefore limit my patients to about 1200 cc. of liquid which includes water, milk, broth, fruit juices, all reckoned as liquids.

There are cases that do well if put on a milk or butter or acidophilus milk diet for a few days. In some instances I make one day a week a butter milk day. On such a day the patient takes a glass of butter milk every three hours with as much orange juice between the milk feedings as he wants.

For several years I have had the notion that carbohydrates in the form of sugar or glucose were beneficial to myocardial cases. For this reason I use a good deal of water ice, apple sauce, and dry non-milk chocolate, also glucose by proctoclysis, if need be.

For patients who have bad taste in the mouth and a dry tongue I order the chewing of gum, a habit for which in health I have only contempt.

If the gas is not controlled by diet an enema with or without milk of asafetida will usually give relief—if not hot wet compresses, flax seed poultices, turpentine stupes, a rectal tube, and finally pituitrin are measures to be employed.

I have said nothing so far about the use of tobacco. I am perhaps a little extreme on this point but my practice is to prohibit smoking or to permit it only in greatest

moderation in the case of patients with myocardial disease.

I shall not go into details of the medicinal treatment in this article. Only a word about digitalis—if there are signs of congestive failure or of auricular fibrillation digitalis is the supreme agent. Its methods of administration are too well-known to be discussed here. Suffice it to say that in the ordinary type small doses are adequate.

A word about calcium. In certain types of myocardial disease even in the painful forms calcium salts frequently act beneficially though it may not be possible to explain this action on pharmacologic grounds. I employ calcium lactate in doses of 6 decigrams in capsule or a tablet or powder of calcium gluconate, 3 times a day.

Psychotherapy: In the patient with real heart disease as well as in him who imagines he has heart trouble—the cardiophobe—encouragement is of the greatest importance. A word of cheer will often make the patient sleep better, eat better, and accomplish more than drugs.

Treatment at Spas: The Nauheim treatment either in its native heath or in certain places, Watkins, N. Y., Hot Springs, Va., White Sulphur Springs, W. Va., often brings about considerable improvement in cases that are not too far advanced. The good results do not depend entirely upon the water but in large measure on the general regime and on the freedom from the daily cares of life that distance brings.

Exercise: When should the patient resume exercise and what exercise should he take? Many of the middle-aged adults who make up the largest proportion of cases in which we see the early signs of cardiac failure are more or less given to golf. I believe many overdo this sport—the call of which for them seems almost irresistible.

Only after the patient has been tested out by having him walk on the level and he is found not to have an undue acceleration of the pulse, undue fatigue, or breathlessness

may he be allowed to play a little golf and then only on an easy course and not to exceed a few holes. In an interesting article in a recent number of the *Journal of the American Medical Association*, (May 4, 1929, page 1522) the editorial writer quotes Kaprovich who points out how much energy an individual expends in walking at the rate of four miles an hour over a conventional level course of 6000 yards:—as much as he would in lifting himself five times to the height of the highest skyscraper in New York. At the speed of two miles an hour he would expend as much energy as would serve to lift him a little over four times the height of the same building and since the golf courses are located on hilly grounds the output of the energy to cover the necessary playing distance is greatly increased. To all of this the work involved in practice and actual shots and in searching for the ball must be added. The writer quaintly adds, "And when it comes to searching for lost balls is all the difference."

One word more—the middle-life patient with early myocardial disease who has an intelligent doctor and co-operates with him, has an excellent chance of dying an old man.

REPORT ON THE SPAS OF EUROPE

E. H. L. CORWIN

At the request of Mr. Bernard M. Baruch, Chairman of the Saratoga Springs Commission, Dr. John A. Hartwell, President of The New York Academy of Medicine, requested the following physicians to undertake a study of the Spas of Europe for the benefit of the Saratoga Springs Commission: Malcolm Goodridge, M.D., Chairman; L. W. Gorham, M.D., Milton B. Rosenbluth, M.D., and John Wyckoff, M.D. Dr. E. H. L. Corwin was asked to serve as secretary. The purpose of this study was to inquire into the organization and administration of the spas, the methods as well as the efficacy of the spa treatment; and to advise whether some of the principles underlying the administration of the "villes d'eau" could be applied to the development of our own resources.

The places visited comprised some of the renowned "cure resorts" of Austria, Czechoslovakia, England, France, Germany, and Hungary. The particular spas were chosen because of their reputed medical importance, their organization, and the differences in ownership control. One of the spas visited is owned and operated by the state, some are owned by the state and exploited by private leasing concerns, others are privately owned and managed without any supervision on the part of the state or any other agency, and still others are owned and operated by their respective municipalities. The members of the Committee visited, either jointly or severally, Bad Gastein and Baden bei Wien in Austria; Karlsbad, Marienbad, and Franzensbad in Czechoslovakia; Harrogate and Bath in England; Vichy, Aix-les-Bains, Royat, Chatel-Guyon, Plombières, Vittel, and Contrexéville in France; Nauheim, Wiesbaden, Kissingen and Bad Brückenau in Germany; and Budapest in Hungary.

It goes without saying that the inquiry relating to proofs of medical efficacy of the spas could not be dealt with at all adequately in the month of time that the Com-

mittee had at its disposal in Europe. In all places visited, the outstanding medical men gave the members of the Committee the benefit of their personal clinical observations, and of such laboratory research studies as had been made. In addition, the members of the Committee interviewed several outstanding clinicians who had no direct relationship with any of the health resorts. The Committee was fortunate in hearing the views of Professor Paul Haertl, the Scientific Director of the Bavarian Spas; Professor Zörkendörfer of the University of Prague; Professor Boehm of the University of Munich; Professors Vámosy and Dalmady of the University of Budapest, as well as Dr. Aladár von Soós; Professor Poupelain of the University of Bordeaux; Dr. O. Baudisch, a recognized authority in the modern methods of chemical analysis of mineral waters, and many others. To all of the gentlemen, the Committee owes a debt of gratitude for the time they placed at its disposal, sometimes at great personal inconvenience, and for the numerous courtesies extended.

THE "ATMOSPHERE" OF THE SPAS

The spas of Europe have a long tradition, dating back in many of their present aspects to the days of the Romans. In some of the baths the pipes laid two thousand years ago or more are still in actual use. Emperors and kings have lavished their bounty on the development of the spas. The communities in which they are located regard them as valuable economic assets and in most places their upkeep is beyond reproach. Hither, hundreds of thousands of people come annually from all parts of the world in search of health and rejuvenation. In the years following the War, the attendance declined, but during the past season it again reached the pre-war level and in some places even surpassed it. The obvious reason for the veritable pilgrimages to the spas is that the sufferers from chronic ailments receive there attention which it is difficult or impossible to receive at their respective homes. Then, there is also the invincible belief in the magic powers of the "min-

eral waters." This psychic phenomenon is carefully nurtured by the well organized spa propaganda. Faith in the efficacy of the waters permeates the entire atmosphere and is shared in alike by the hotel keepers, tradespeople, bath attendants, rich and poor patients, and the local practitioners. It creates an atmosphere highly conducive to the care of the sick, which is a decided asset in the treatment of many types of ailments.

The physical environment adds to the maintenance of this attitude on the part of the patients, as well as to their comfort. The springs are encased in buildings which often have the appearance of shrines. The patients are impressed with the potency of the waters and are warned against the use of them; either internally or externally, except as ordered by the physicians. The prescribed diet must be rigidly followed, as must be the regulations for rest and exercise. The hotels and restaurant keepers cooperate with the management of the spas in providing certain required facilities for the guests, and in serving meals particularly adapted to the requirements of the sick.

In many of the places there are private sanatoria, usually under the management of physician-proprietors, where the patients remain under the complete supervision of the establishment during their stay at the spa. Arrangements are often found whereby mineral water baths can be taken at the hotels or sanatoria.

Except in the French resorts, gambling establishments are generally proscribed. Everywhere, walks are laid out in the parks where are also located the casinos, tea rooms, covered promenades, open air orchestras, and other diversions, as well as opportunities for social gatherings.

Although some of the spas are located amid natural scenic beauty and enjoy a good summer climate, very many do not have this added advantage. At some of the resorts the summers are hot and humid, or rainy, and in others the surrounding country is flat and uninviting. Everywhere, however, provision is made for inexpensive excursions,

motor drives to places of beauty or historic interest, horse-back riding, golf, tennis, and similar recreations.

Although in most of the spas the season lasts during several months of the year, there are certain spas which are used throughout the year. The attendance, however, is greatest during the period corresponding to the usual summer vacations. Very often the course of treatment at a spa is followed by a period of "after cure." Patients are advised to go to the mountains or to the seashore for a period of recuperation. This habit on the part of very many people to visit some health resort during the summer, provides not only an opportunity for restorative, but also for preventive treatment. Their condition is checked up annually and for at least a certain period during the year they lead a soundly regulated life.

THE PROBLEM OF "THE CHRONIC"

There is probably no other civilized country in the world where those afflicted with chronic maladies receive less consideration than in our country. This can hardly be gainsaid. The problem of "the chronic" has been an open challenge to the American medical profession for a long period. Very little, however, has been done to meet it. Physicians are naturally more interested in and more concerned about the acute manifestations of disease than they are in its chronic stages. And yet, to the afflicted individual, it is a matter of great concern; for the affliction, whether it be of renal, cardiac, digestive, neuro-psychic, or "rheumatic" character, interferes with his efficiency as a breadwinner and as a member of society. The problem of chronic disease is an important social problem which the medical profession will some day be forced to realize and meet in an adequate manner.

There is no doubt that the failure on the part of the medical profession at large to employ all the means at its disposal to deal with chronic disease has been responsible for the growth of cults. The relief which many patients

receive from the administration of the various kinds of physical and psychic therapy practiced by the exponents of these cults, has resulted in the development of spurious practices which often are as injurious to the individual and inimical to the public health, as they are lucrative to the charlatans. It is because of the concern in the problem of the care of the chronically afflicted that the undersigned accepted the commission to visit and study the spas of Europe.

THE RECOGNITION OF BALNEOLOGY

In Europe, the public has forced the hand of the medical profession with regard to the spas. Multitudes go every year to the "Heilquellen" and return seemingly much benefited. Many patients make it a practice to go to a selected health resort from year to year, over long periods of time; others try different spas each year, some taking more than one "cure" in a season. Many physicians, including the leaders of the medical sciences at the universities and their families, take the treatments themselves. In many of the important medical schools, balneology is taught either as a part of therapeutics or pharmacology, or as a special elective subject. The students are given an opportunity to visit the spas, the state making contributions toward their maintenance during the visits, and the railways giving reduced or free fares. In almost every one of the important spas, conferences are held each year to which physicians are invited, and at which the therapeutic effects of the waters on various diseases are discussed at length. Very often, men of note present papers, and the proceedings are reported in the medical press of the particular country, or published in separate volumes. In almost every country there exists a national balneological society, and the International Balneological Association holds its conventions annually. Mineral springs are found in virtually every country and most of the countries of Europe have established, under government auspices, Institutes of Balneology or Hydrology where studies of the physical

and chemical properties of the mineral waters are made, and data compiled thereon.

ADMINISTRATIVE CONTROL

The state or provincial governments exercise supervision over the spas. In France, the government maintains an inspector at every resort, whose salary is paid by the company leasing the spa from the government, except at Aix-les-Bains, which is operated by the state itself, or at resorts owned privately, like Vittel. In Austria, the provincial governments maintain technically trained supervisors whose duty it is to safeguard the supply of the waters and to advise on engineering and cognate problems, although the springs, as a rule, are the property of the municipality in which they are located. The same applies to Czechoslovakia where the springs, except some at Marienbad, likewise belong to the municipalities. In Marienbad, a suit of many years standing is in progress between the town and the monastery relative to control over the springs. In Bavaria, the government maintains an expert staff to plan the development and supervise the exploitation of all the medicinal water resources of the realm, as well as to render technical advice in the heating of the waters, the preparation of fango, and like problems. In Great Britain, the principal thermal stations have formed the British Spa Federation.

With the exception, perhaps, of Aix-les-Bains which is managed directly by the state, the revenues derived from the spas more than cover expenditures. This favorable balance is very often due to profits from the extensive sales of the mineral waters and salts. Some of the well-known spas, like Vichy, Karlsbad, Neuenahr, Ems, Vittel, Evian, and others sell millions of bottles annually. The bottling works are operated by the municipalities owning the springs, or by the same concessionaire companies which are managing the particular spas.

THE WIDE RANGE OF SPA TREATMENT

The number and variety of conditions for which the waters of each spa are employed therapeutically are imposing, due not only to the diversity of the chemical contents of its many springs of different pharmacological potency, but also due to the differences in the thermality of the waters and in other properties peculiar to each spring. The healing qualities claimed for each spa invariably comprise a very long array of unrelated conditions, and the contra-indications mentioned are usually very few. The perplexing aspect of the science of balneology is that waters of different chemistry and thermality are often considered suitable for the treatment of the very same pathological conditions. In the achievement of the results there are evidently influences at play which supplement the purely pharmacological and thermal qualities of the waters. Although the spas, as a rule, make a universal appeal, their renown rests, nevertheless, on their peculiar efficacy in certain major conditions. Nauheim and Royat, for example, are recognized as the stations, *par excellence*, for the treatment of cardio-vascular affections; Karlsbad, Marienbad, and Vichy for metabolic, gastro-intestinal, and hepatic disorders; related to these are Harrogate, Kissingen and Homburg. Then Aix-les-Bains, Wiesbaden, Salso Maggiore, Neuenahr, Droitwich, Bad Gastein, and many others derive their reputation as of great benefit to the gouty and "rheumatic" patients; Franzensbad, Luxeuil, Woodhall Spa, and Kreuznach, as stations for the treatment of the diseases of women; Wildungen, Brückenau, Contrexéville and Vittel for renal affections; Luchon and Pistyan for cutaneous diseases; Mont-Dore and Ems for respiratory difficulties; Nérís and Oeynhausén for nervous debilities; Plombières for colitis; Chatel-Guyon for chronic constipation; Schwalbach for anaemia, and so on. No hard and fast line can be drawn anywhere between them.

CLASSIFICATION OF THE MEDICINAL SPRINGS

It is very difficult to classify the waters accurately, either in relation to their therapeutic action, or to their chemical composition. The most common classification of the medicinal springs is based on the chemistry of the waters and recognizes six major types, with more or less numerous subdivisions under each type.

The *muriated* or *common salt waters* have sodium chloride as their principal constituent. The amount of salt varies from 2 parts per 1000, as at Baden-Baden which is below sea water concentration, to 330 parts per 1000, as at Morszyn, Poland, which is about ten times the strength of sea water. In addition, the muriated springs contain in variable quantities, sulphates of sodium and of magnesium, sodium bicarbonate, and many other minor but important admixtures, such as arsenic, lithium, stronthium, iodine, bromine, etc. The waters issue cold or hot, and very often contain variable amounts of free carbonic acid. Only the weaker salt waters can be employed internally, the stronger ones being used only as baths.

In the *alkaline* waters, sodium bicarbonate is the predominating ingredient. Some of these alkaline waters like Vichy and Neuenahr are simple. The larger number, however, contain considerable quantities of common salt as well as sodium sulphate, magnesium sulphate, salts of calcium, arsenic, and iron. These springs, likewise, are of different thermalities, and frequently contain free carbon dioxide.

To the third major group belong the *sulphur* waters in which the sulphur appears in the form of sulphides and sulphurated hydrogen gas. The mineralization of these waters varies considerably, very many of them containing large quantities of common salt (the "bitter waters"); others, carbonates. The sulphur waters, as a rule, issue cold.

The *calcareous* springs are both hot and cold, and have

for their main constituents the carbonates of calcium, of sulphate, and of magnesium. They sometimes also carry free carbonic gas.

The *chalybeate* or *ferruginous* waters contain bicarbonate or protosulphate of iron in quantities sufficient to render them therapeutically active; often in combination with free carbon dioxide gas and other components.

Finally, there are the "simple" or "indifferent" *thermal* springs which are feebly mineralized, issue at temperatures varying from 60° to 120° F. and are, as a rule, radioactive.

THE THEORY OF BALNEOLOGY

The therapeutic action of the waters, when taken internally, is primarily due to their aperient, purgative, and diuretic qualities, to their tonicity in relation to the blood serum, as well as to their bactericidal and bio-chemical action of which a great deal is made by French writers. It is claimed that artificial preparations, although of the same gross chemical composition, never produce the same beneficial results as follow from the employment of natural waters. This, it is maintained, is due to the peculiar chemical "balance" of the waters as they issue from the springs. The constituent elements of the salts are partially in a state of ionic dissociation, or in a colloidal state, and it is claimed that the minerals and metals found in minute quantities may, like vitamins in food, play an important, though not as yet fully ascertained part. Mineral water, when it comes from the spring, is absolutely clear, but it undergoes a very rapid change under the influence of light and outside air, as well as exterior temperature and pressure. After a short period a white precipitate of originally dissolved material becomes visible in the water. Reliable chemical research of the last few years seems to show that "active substance of a curative water may be present in extremely small amounts, and often only slight traces of a substance suffice to bring about profound bio-

logic changes in animals and in man." . . . "Amounts of substances which are hardly weighable and perhaps only spectroscopically detectable are capable, under certain circumstances, of exerting great biologic effects and are, therefore, of therapeutic significance." . . . "It has been established that the electrolytes play a part in determining the constitution of man, and that in the coöperation of many electrolytes is to be sought one of the fundamental curative factors in the therapeutic use of mineral springs. The use of drinking cures stands preeminent in the possibility that it offers of administering to the human body sufficient quantities of electrolytes in a dissociated state and in combination with many other ions. By means of baths, too, ions such as calcium can be brought through the skin, as Wermel has recently shown."*

Perrin and Mathieu** maintain that the mineral substances dissolved in medicinal spring water furnish the (intermicellar) liquids with a variety of salts in a colloidal state which are essential to the proper nourishment of the cells. The ions and colloids of the mineral waters carry an electrical charge which neutralizes that of the electrolytes and the colloids of the (intermicellar) liquid, and which are likely to cause the flocculations of the living colloids. They play, therefore, a defensive part as well as a nutritive one. According to the nature of its chemical composition, mineral water is regarded as possessing a specific protective action on the organic cell.

The chemical phenomena which condition the cellular life produce oxidation. The mineral waters are claimed to facilitate the release of oxygen contained in the hemoglobin, thus aiding, indirectly, general nutrition. The

* From the Laboratories of the Rockefeller Institute for Medical Research, published by the *Archives of Internal Medicine*, October 1927. Baudisch and Davidson: "Natural Mineral Waters in the Light of Modern Research."

** Perrin and Mathieu, "Les Eaux Minérales," pp. 57-68, Paris, 1925. Ernest Flammarion, Editeur.

chemical reactions in the tissues are expedited by the catalyzing effect of the mineral waters. On this point the reader will find interesting observations in the report by Baudisch and Davidson of the Rockefeller Institute of Medical Research on "The Catalytic Action of Saratoga Springs."

All the theorists of balneology go into details of the physiologic action of the main chemical constituents of the mineral waters, such as sulphur, chlorides, calcium, sodium, magnesium, potassium, iron, arsenic, and many of the other elements which are frequently found there in different quantities.

Of late years, a great deal has been made of the radio-activity of the mineral waters as a therapeutic agent. Tomes have been written on the subject and tons of advertisement distributed broadcast. And yet, at one of the spas with indifferent thermal waters and considerable radio-activity, good therapeutic results were recorded for a century or so, although until comparatively recently the waters were collected in open reservoirs and kept there for many days before being used, all traces of the radium emanation having disappeared by that time. At Bad Gastein, interesting comparative experiments were made with natural and artificial radium-irradiated water. Natural radioactive water stimulates the production of hydrochloric acid in the stomach, while artificial radium water does not produce such effects. Frogs' eggs grow to twice the ordinary size in the natural radioactive water. The employment of the radioactive water accelerates sedimentation of red blood corpuscles, while the artificially radiated water fails to do so. It stimulates ovarian and testicular glands, and is claimed to be of benefit in the treatment of arterio-sclerosis, gout, arthritis deformans, Heberdeen's nodes, sciaticas, neuralgias, myalgias, renal calculus, and others. Hypertrophied prostates are improved by irrigations with radioactive water.

THE THERAPEUTIC CLAIMS

Although in the past the reputation of the average spa physician has not always been of the highest, there has developed, particularly since the War and the ensuing economic changes in the life of many of the European nations, a somewhat different attitude on the part of medical men toward spa practice. Many very able clinicians have taken up work at the health resorts. By precept, study, observation, and their own experience, a body of knowledge has been developed relative to the application of the spa waters to a vast variety of chronic ailments. It may be said, however, that the use of the waters internally and externally, as well as the physical therapy employed, are supplementary to the basic, medical consideration of each case.

It must be recognized that the highly mineralized waters are, *de facto*, potent compound drugs which, when taken internally, cause profuse elimination of waste matter, either through the bowels or through the kidneys. These eliminants, when judiciously used in connection with diet, exercise or rest, as the case may call for, produce beneficent effects in very many disease conditions resulting from defects of nutrition, faulty metabolism, disorders of circulation, or disturbed neuro-psychic balance. The sulphated waters, both alkaline and muriated, act on the liver and are of proven benefit in many kinds of hepatic derangement, and even in cholelithiasis.

The pharmacology of the mineral waters in their almost infinite variety and degrees of strength, has received a great deal of honest study, and so has the physiologic effect of these waters when employed in the form of baths, as well as in sprays and douches. The results of the various kinds of diaphoretic, gaseous, saline, brine, sulphur, peat or mud baths are attributed to "the excitation of changes in the circulation, general and local, leading to improved blood and lymph supply to the tissues, and accelerated interchange of tissue fluid; the raising of the resistance of

the body to infection by the production of bactericidal substances in the blood, and the flooding of local parts with fresh blood and lymph charged with antibodies; and the effects, sedative or stimulant, of temperature, percussion, massage and the like on the nervous system." (See *Lancet*, June 1, 1929. Lecture by Wilfrid Edgecombe, M.D.)

Gaseous and saline baths promote cutaneous excretion and improve the peripheral and general circulation by dilating the superficial capillaries, thus lowering vascular tension. In view of the evident importance of carbonated water baths, and particularly in relation to Saratoga Springs, the reader is referred to a statement on the effect of effervescent baths, as presented by Dr. R. Fortescue Fox in his book on "The Principles and Practice of Medical Hydrology," published by the University of London Press, London, 1913. This statement is reprinted in full in the appendix to this report. (Appendix No. 1).

Without a multiplicity of carefully planned laboratory research experiments and many control series of patients, it is obviously impossible to arrive at a scientific and precise determination of the effect of the waters as therapeutic agents. Hitherto, no important study of this character has ever been made. The so-called scientific evidence is based on sketchy or inconclusive experiments, made rather hurriedly, or on incomplete clinical data. At no spa has any serious attempt been made to organize systematic, scientific research. It is only recently that a scientific institute was established at Nauheim, and its scope enlarged, thanks to the generosity of an American patient who thus expressed the gratitude felt for the benefits derived from the treatment there. The spa physicians have a rather short season and it is hardly to be expected that they would keep records of patients in a way which would make them valuable for serious scientific reference. The records are sketchy, as a rule, and contain the minimum amount of information required for ordinary practical purposes. A large part of the balneological literature must needs be

inconclusive at best; here and there one may find a minor contribution of scientific value. The remainder may possibly be of service as a record of clinical observation, and of the results of empirical experience.

The members of the Committee attempted to procure evidence from the available literature and from the leading balneologists interviewed. The replies to a series of questions submitted to Dr. Groedel at Nauheim which he kindly made, are the best testimony which was received. This will be found in the Appendix to the Report. (Appendix No. 2.)

RECAPITULATION

It will be seen from the above that spa treatment comprises much more than mineral water treatment. It is organized around the mineral waters, to be sure, but the waters constitute only a part of the regimen. At the spas every patient is under medical care—in very many instances under very competent medical care. He gets, in addition, all that the natural and artificial environment contributes to the amelioration of his condition somatically and mentally, and his diet, exercise, rest, and physical therapy are prescribed for him in minute detail. To evaluate the importance of any one element in the treatment is impossible except under ideal conditions where control experiments could be carried on for a considerable period of time with adequate follow up.

The clinical testimony is enormous in bulk. The major part of it can be easily discarded as of no scientific value. There are contributions, however, which have been made by the more modern type of physician who has taken up the work of the spas, and whose testimony cannot entirely be brushed aside. Many of them have fortified their observations by laboratory tests and by experimentation on animals. There does not exist any evidence based on control experiments. While there is no doubt that carbonated baths like those of Nauheim or Royat lower hypertension

at least temporarily, and that the use of waters like those of Contrexéville, Karlsbad, and others produces changes in metabolism as evidenced by the chemical composition of the blood and the urinary output, the claim that CO₂ gas is absorbed through the skin and that this absorption has an effect similar to that of digitalis, is hardly convincing. Statements are often made for which no adequate proof has been adduced, and which evidently are not relied upon entirely by the spa physicians, themselves, for at Nauheim and elsewhere ordinary therapy is employed in addition to the carbonated baths. Traditionally and empirically, the waters at the spas are utilized as a part of the general plan of treatment and with, no doubt, beneficial results.

Aside from the fact that the imbibition of mineral waters results in purging the body of effete matters and in the stimulation of metabolism, little of a definite character has been established concerning their physiological, chemical and bio-chemical effects. An opportunity for "prospecting" lies open in a field of seemingly important resources whose surface only has been scratched by the tools of science.

ACCOMMODATIONS AND CHARGES

The spas endeavor to provide facilities for all classes of patients. Just as there are hotels and boarding houses of different grades of comfort, so the bathing and physiotherapy establishments differ in appointment from the luxurious to the very modest. Patients patronizing the spas come from all strata of society—from crowned heads to workingmen who are sent there as beneficiaries of the sickness insurance funds. In many of the resorts the benevolent insurance funds maintain their own homes, and at some of the spas, charitable associations have established institutions for the poor, particularly for sick children.

In the Class "A" bathing establishments, there are the super-luxe compartments with private salons for rest.

There are also, of course, the less luxurious rooms. The cheaper establishments are equipped with modest bathing facilities and with rest bunks in large wards. Everywhere it has been pointed out that the fundamental services are alike, the differences being only in equipment and trappings. In all of the establishments the baths and treatments are given on a very strict appointment basis. As the demand for treatment is greater in the morning than in the afternoon, the prices are accordingly higher for morning than afternoon treatments, in every class of accommodation.

The charges for the baths and treatments vary from place to place. The more fashionable resorts are somewhat more expensive than the less renowned ones. In addition to the established rates there are additional charges for supplementary services, for linen, attendants, and so on. It is difficult to arrange the charges in tabular form for comparative purposes, because the ranges are wide and the items too numerous. For purposes of illustration, the prevailing scale of charges at Bath, England; Vichy, France; Kissingen, Germany; and Karlsbad, Czechoslovakia, are reproduced in the appendix as typical of charges in the European spas. (See Appendix No. 3). On the average, the daily cost for first class treatments (not de luxe), with no inordinate amount of physiotherapy, amounts to between \$3.00 and \$5.00 in American money. For the cheapest type of treatments, it probably averages around \$1.50 per day.

At most of the spas there are Institutes of Physiotherapy where all known mechanical contrivances are to be found, as well as all the modalities of electrotherapy. These Institutes, as a rule, are very frequently rented out to physician who are responsible for their management and operation. In some of the spas, the Institutes are the property of the company, or the municipality, as the case may be, and the physicians in charge are employed on a salary basis. Hydro-therapeutic equipment, as well as facilities for colonic irrigations and vaginal douches are

usually provided in the bathing establishments. In some places, notably Karlsbad and Franzensbad, dry gas baths are given. In other places facilities for open air sun baths are provided on the roofs of the buildings. In some of the spas there are inhalatoria, the one most interesting being the Gradier Bau at Kissingen. This is a very tall structure of white thornwood, over which the saline waters are continually played, creating a fine spray. Around this structure are terraces with steamer chairs which are hired by the day or week, and in which the patients repose, inhaling the aromatic, moist air. In very many places there are facilities for throat gargling with especially suitable waters.

The drinking halls are usually very imposing in size, affording ample opportunity for the patients to sit around or walk while sipping the waters. There are also protected promenades, and in the morning and afternoon at the customary drinking hours, there is music. It is here that *tout le monde* meets and it affords an opportunity for the display of gowns, and for talks about the events of the day and changes in symptomatology.

Every spa is provided with a clinical laboratory and an X-ray laboratory. These often belong to individual physicians, sometimes again to the concessionaire companies. The most ideal relationship of the laboratories to the practicing physicians, exists at Contrexéville where the director of the establishment is a man of recognized eminence, a professor of surgery at one of the universities, who is on a salary, and stands in a consulting relationship to the practitioners. The charges for laboratory and X-ray work at the spas correspond to the charges for similar work prevailing in the country in which the spa is located.

In many of the spas, the practicing physicians adopt a scale of compensation for their services. In some this scale is lower for nationals of the "poorer" countries, and higher for those of "rich" countries. Although one hears occasionally of exorbitant charges, on the whole the rates

charged are very reasonable. In many of the resorts, physicians maintain sanatoria where competent care is given to the sick and control exercised over their mode of life and medication. Some of these sanatoria are of a serious medical character; others are operated in ways to impress the patient with the multiplicity of apparatus and treatment procedures, and for making as much as "the traffic will bear."

With the exception of Harrogate, at all the spas a cure tax is levied on persons staying longer than a couple of days. This tax is collected by the hotels or boarding houses and it varies in accordance with the type of hotel accommodations. The economic status of the sojourner is thus gauged. Physicians and their families are exempt from the taxes, and at some of the resorts certain other occupations, such as teachers or government employees, pay reduced taxes. In some of the resorts the tax amounts to as much as \$10 per head. The money usually goes toward the upkeep of the resort, improvements, amusements, orchestras, maintenance of roads, parks, benches, and so on. A part of it, no doubt, is assigned to promotional expenses. These must be quite heavy, judging by the amount of so-called literature that is freely distributed. Some of it is misleading and no doubt does harm in many instances by the exaggeration of the effectiveness of the cure. Many very sick patients and many of those who can ill afford travel and residence at a distant resort, are lured hither by the advertisements, direct and indirect. Just like in one of the text-books on American Spas, there are pictures of hotels which are really but architectural projects, so in the advertisements distributed on the steamships, there are pictures of opera houses at some of the resorts where there are no such, or even inferior, luxuries to be found.

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CORRECTION

In the following letter Dr. Carlisle has called attention to an error which appeared in the Bulletin (2nd Series, Vol. VI, No. 7, page 500, line 25.)

July 28, 1930

"The account of the Dinner given in honor of Doctor Welch which is published in the Bulletin for July is a full and very interesting one of a delightful and memorable occasion.

"There is in it, however, a serious error in the report of Doctor Welch's remarks which I must ask you to endeavor to correct, please. On page 500, at the end of the first paragraph, credit is given to me that rightly belongs to Dr. Walter Lester Carr; they were Doctor Carr's slides that Professor Welch spoke of,—not mine. We sat at the same table and Doctor Welch happened to mention my name first and no doubt due to the similarity of sound, the stenographer made the error.

"The compliment Doctor Welch paid to Walter Lester Carr was well-deserved and should go to him and not to me.

"Will it be possible to make a note of this in some way?

Robert J. Carlisle."

DEATHS OF FELLOWS OF THE ACADEMY

WALTER M. BRICKNER, M.D., 151 Central Park West, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1896; elected a Fellow of the Academy February 2, 1905; died, July 22, 1930. Dr. Brickner was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the Society of Associated Alumni of Mt. Sinai Hospital, a member of the Society of Alumni of Sloane Hospital for Women, Associate Surgeon to Mt. Sinai Hospital and Surgeon to the Morrisania Hospital and the Hospital for Joint Diseases.

CONDUCT WALKER CUTLER, M.D., 667 Madison Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1882; elected a Fellow of the Academy April 7, 1892; died, July 9, 1930. Dr. Cutler was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the Society of Alumni of Bellevue Hospital and Consulting Physician to the New York Dispensary.

WALTER EYRE LAMBERT, M.D., 112 East 35 Street, New York City; graduated in medicine from the Royal College of Physicians and Surgeons of Edinburgh, in 1884; elected a Fellow of the Academy June 3, 1897; died, July 28, 1930. Dr. Lambert was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Ophthalmological Society and Consulting Surgeon to the New York Eye and Ear Infirmary.

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THE EYE IN RELATION TO GENERAL MEDICINE

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*Delivered, January 24, 1930, in the Friday Afternoon Lecture Series of
The New York Academy of Medicine.*

The eye, in many general diseases, gives important indications. Its tissues are highly specialized and susceptible to irritants, and the extent and progress of the general condition can often be judged from the local appearance. Many functional conditions give irritative symptoms, the most important of which are eye-aches or headaches.

The subject of headaches caused by eye irritation is one which has received a great deal of attention in the literature. All sorts of attempts have been made at classification with, on the whole, rather confusing results. A recent paper by de Schweinitz (*Journal of the Medical Association of Georgia*, vol. xviii, No. 2, February, 1929) is notable and one that I cannot too highly recommend. On the present occasion I shall try to give a few practical ideas as to what types of eye disturbances cause headaches, so that, reasoning from the other end of the proposition, a certain type of headache may lead one to suspect eye trouble.

Eye headaches come most commonly from hyperopia, with or without astigmatism, although mixed astigmatism is a potent cause but occurs less commonly. Myopic astigmatism may also give headaches; while simple myopia, as a rule, does not. The increased effort that the ciliary

muscle makes in attempting to focus the astigmatic eye, and particularly the *unnatural* effort, leads to stiffness of the ciliary muscle and finally to cramp. This cramp, or the astigmatism causing it, leads to blurring of vision, in material degrees of error, while in lower degrees the muscle may strain over the error, so that the vision remains normal, while the muscle itself is cramped and sore. The first reaction is in the ciliary muscle, and the eyes themselves ache, while later on the irritation is reflected and becomes a frontal headache, an occipital headache, or even a more distant reflex. Time, therefore, is a very important element in the case, and in children of five or six years old that have not begun to co-ordinate, it is very unusual to see a well marked headache, while muscular ache in the eyes is the rule in older astigmatic cases. If the child goes on straining to an older period, say eight or nine, headaches become increasingly common. Naturally, they are made worse by reading or any use of the eyes at the near point, and are apt to occur late in the day and not early in the morning after the night's rest. If the strain goes on getting worse the cramp may become so chronic that headaches most of the time may supervene; but at the present time this is not often allowed to occur.

A rather useful test is the application of hot fomentations to the eyes. If the headache is from eye-strain and is just beginning, the heat is very apt to relieve it. The severity of the headache is due partly to the amount of the error and the time the eye-strain has gone on, and also to the degree of stability of the individual's nervous system. A robust phlegmatic child will be more apt to have an eye-ache for a time, while a nervous unstable child may have relatively few symptoms of eye-strain but plunge rapidly to the more general reflex of headache.

Disturbance of the muscle balance between the two eyes can also give headaches. Exophoria or convergence excess is a frequent cause and often occurs where the vision is normal. Vertical disturbance or hyperphoria,

while not a very common occurrence in a number of individuals, is nevertheless a very important source of irritation when it does occur. The effort of pulling one eye down, or the other eye up, it may be, is an entirely abnormal one and is very apt to cause dizziness or vertigo. In fact, while this symptom may rarely come from astigmatism, it is most apt to come from hyperphoria and is readily corrected by the wearing of a proper prism or by a muscle operation designed to bring the eyes on the same line.

Dizziness may also occur in cases of external muscle paralysis of the third, fourth, or sixth nerves. These cases are always accompanied by double vision and are really due to a toxic inflammation of the nerve. A large proportion of the third nerve cases are luetic in origin; the eye is turned down and out, the pupil is dilated, and the upper lid droops. The fourth and especially the sixth nerve paralysis may come from a great variety of causes—sleeping sickness, suppurative middle-ear disease, tooth abscess, cerebral neoplasm, diabetes, etc. Treatment of the underlying condition often clears up the paralysis perfectly.

Conjunctival inflammations fall into two broad classes, infections, and inflammations due to chemical disturbances in the blood. Infections are always characterized by pus formation; the more severe infections have profuse discharge of thick creamy pus, the milder ones have less; but it is perhaps not too sweeping an assertion to state that every true infection has some amount of pus discharge.

On the other hand, a great many persons have reflex congestion of the conjunctiva from eye-strain, or smarting and congestion where no eye-strain exists but where chemical faults occur. In such cases, the normal use of the eyes makes them smart. The mucous membrane of the lids is red and hypertrophic and at times has a scanty discharge. The commonest example of this is in the full-blooded high living individual, who shows a general dilation of the

capillaries of the face. Such cases always have to have astringents applied to the lids in order to relieve the hypertrophy, but a satisfactory result can seldom be attained by local means alone. The chemical examination of the blood will usually show some disturbance—as high urea or high uric acid—and until the digestive condition is corrected a certain tendency to recurrence is often shown.

Sub-conjunctival hemorrhage is a common condition and is often ignored. It is frequently, however, a symptom of circulatory irritability and should always be considered. It may be due to high blood pressure with arteriosclerosis or, on the other hand, may be due to only a temporary rise of pressure in an otherwise healthy person. Frequently the blood pressure is not taken until some hours after the attack and no elevation is found. It is therefore assumed that the hemorrhage is purely an accident. This is often not the fact. A certain amount of fatigue and irritability can often be assumed and—unless an unusual strain, like an attack of coughing in whooping cough is known to have occurred—such patients will bear watching and regulation.

Corneal disease, except for a few special forms, always means depression or even malnutrition. On account of the peculiar lymph circulation, ulceration occurs very readily in those who are below par. Regulation of the digestion and tonic treatment are almost always indicated. In certain types of corneal ulcerations in elderly people, alcohol is almost an essential; it is best administered in the form of milk punch; its rapidity of action gives it a place occupied by no other drug; iron and strychnine, which have a certain value, both are too slow in their effects. Of course local treatment of the ulcer is highly important.

Iritis and cyclitis, inflammation of the iris and ciliary body, are invariably due to a constitutional toxin; the tissue is spongy, sensitive, and reactive—and the vascular reaction to a toxin is very severe. The resulting symptoms of redness, pain, plastic deposit, while subject to a

great amount of variation, may be quite severe and by the degree of their severity indicate the amount of intoxication. Twenty-five years ago it was considered that a large proportion of both these diseases were syphilitic in origin, and this is probably true. Many writers gave the proportion about as follows:

Syphilis, 75 per cent.

Rheumatism, 23 per cent.

Tuberculosis and other rarer forms, 2 per cent.

We saw two special types of specific iritis: that appearing in the secondary stage, which was simply a severe plastic form; and that occurring in the later stages, which was characterized by a reddish mass on the pupillary margin, which was variously assumed to be a condyloma or a gumma. No doubt these forms still exist in certain localities, but the advent of the Wassermann test and the intravenous treatment with salvarsan have made both forms almost a rarity in our practice here. The early and positive diagnosis of syphilis, followed by efficient treatment has given a totally different complexion to the question of its clinical importance. On the other hand, it has been repeatedly pointed out, especially by English and American writers, that the word rheumatism was merely a convenient scrap-basket for a great variety of toxic conditions, and that the only true rheumatic iritis was the form that occurred during an attack of acute rheumatism, which is rather rare. This is undoubtedly correct, and iritis and cyclitis, in combination as they frequently are, or separately, are to-day most often caused by focal or digestive infections. There are a few rare forms, such as tubercular or leprous iritis, where the germ occurs in the tissue itself; but in the vast majority of cases seen in this locality search for a cause resolves itself into a blood test and then a search for local infections.

I designedly pass over those forms which occur in meningitis and other infectious diseases where the cause is obvious. Undoubtedly a simple digestive sepsis can give an

inflammation of this type. It usually occurs in those who are much depressed and perhaps anemic, and tests of the urine, chemistry of the blood and perhaps also of the feces will furnish definite indications. It is most apt to be bilateral, as one would expect, and may be accompanied by low grade arthritis of the small joints or other evidences of a general chemical disorder. However, when a patient in apparently good health suddenly develops an iritis or irido-cyclitis in one eye, and the general tests—kidney, blood, intestines—show nothing abnormal, the search for a cause usually centers in the infections that occur in the head. There are a few rare infections that may occur in other parts of the body—prostate, appendix, genital tract, as from chronic gonorrheal infections, etc.—but these are rarely met with and it is only necessary to investigate to find the cause.

Head infections, however, are frequently latent, yet they form a large proportion of the cases. There is no question that a tooth abscess may cause an iritis, but that it often does so is very doubtful. The pus occurs in very small quantity in an apical abscess and is often confined in a rigid bony space where absorption must be very difficult. It is conceivable that under certain circumstances absorption from pyorrhea may occur in sufficient amount to lead to an infection of the iris, but under ordinary circumstances the pus drains away and no infection occurs. I do not wish to give the impression that examination of the teeth is not important; where other infections exist, there is always a question as to whether or not a diseased tooth may be adding to the sensitization of the patient, and where the question is of sufficient importance a diseased tooth should be extracted. As a sole and primary cause of iritis, however, it does seem that the rôle of the teeth has been somewhat "over-played." Too often the extraction of a diseased tooth has no effect whatever on the process.

The tonsillar question is a very different story. It is well known that the tonsils harbor infection very readily and that when they are once infected they seldom free

themselves from the infection. Constitutional effects from tonsillar infection are too well known to receive more than passing mention. It follows then that iritis from tonsillar infection is a most reasonable thing to expect, and as a matter of fact it does occur quite frequently. The difficult question to decide is when the tonsils are infected and how much they participate in the process as compared with the upper nasal air chambers, or the sinuses. It is, I think, quite generally agreed that the presence of bacteria on the tonsil means little, except that some strains of bacteria are undoubtedly more deserving of being objects of suspicion than are others. Enlargement of the tonsils and a history of tonsillar attacks, particularly abscess, are significant; and the ability of the tonsil to exude pus on pressure is perhaps the most significant symptom of all.

Iritis and cyclitis may be caused by a purulent antrum—a condition which must be considered a focal infection. Purulent disease of the ethmoids and sphenoid can also act as a cause, and do so chiefly when pus develops in a confined cell. In both of these cases a rhinological examination will most probably show pus coming from the affected spot.

There is, however, another type of sinus disease which we must now consider. Where the case is frankly a purulent one, the mucous membrane is apt to thicken so as to interpose a wall of resistance to further infection. In certain cases the infection seems to extend beneath the mucous membrane, and the chief changes are in the bone. We have then a low-grade osteitis which is capable of causing iritis, cyclitis, choroiditis, retinitis, or neuritis. There are few definite symptoms in these cases and x-ray findings are of little help. Still, when a sinus operation is done the eye condition at once clears up, showing conclusively that the eye infection came from the sinuses. The diagnosis is the difficult part and must rest upon the type of the eye inflammation and the absence of other causal findings. This is a matter of close co-operation between the ophthalmologist and the rhinologist. Whether the tonsils or the sinuses

become infected first and which infects the others, are difficult questions. According to most of the opinions in my own circles, the tonsils are the first infected, though the more one studies head infections the more one is impressed with the feeling that they are much more general than local. At the same time, they frequently center at one spot and operation on this spot enables the patient to master the rest of the process himself. For instance, we frequently see badly infected tonsils in the presence of a low-grade ethmoiditis, and after the tonsils are removed the ethmoiditis subsides. What should be done surgically is often a very important decision and one which rests chiefly with the rhinologist. The surgeons whose judgment is most to be valued, I think, are inclined to take out all manifestly diseased tissues and to make as clean a sweep of the infected material as possibly. In many instances this stops the infection and the patient has no further trouble. It must always be remembered, however, that the operation does not always secure bacterial immunity, and, after the tonsils are removed and the sinuses exenterated, reinfection can occur and immunity must be secured by other measures—vaccines, general treatment, change of climate, etc.

What has been said concerning the iris applies, to a large extent, to the similar tissue, the choroid. Before the Wassermann test and the salvarsan treatment, many cases of scattered or disseminated choroiditis were observed that were undoubtedly of specific origin. We do not see so many of these now-a-days and yet we see plenty of cases of choroiditis. The causative factors seem to be digestive or focal infections; the choroid seems rather more susceptible to digestive changes than the iris and ciliary body. Again I pass over infectious diseases, as meningitis, since the causation here is well known.

Aside from the ophthalmological appearance, the most striking symptom of choroiditis is haziness in the eye or floating spots before the vision. These spots are inflammatory and are dense enough to obscure the vision, whereas

the tiny normal floating spots which are known as "muscae" are transparent. The myopic eye is particularly predisposed to choroiditis on account of the fact that the tissue is stretched and its blood and lymph circulation are materially interfered with. It was formerly supposed that the choroiditis of myopia was largely a mechanical affair and was due to tearing of the tissue as the eye elongated. However, it seems much more probable that it is a toxic process in a tissue which has been rendered vulnerable. The search for the toxic cause must be thorough and very exhaustive, as a slight disturbance can cause a marked process in the myopic eye when it would cause much less severe a process in a normal eye.

Choroiditis occurs at times in young children and is due to digestive disturbances—acidosis, etc. Unfortunately, it frequently passes unnoticed, and later a spot of retino-choroidal atrophy develops which, if it be near the macula, will affect vision seriously and permanently. A spot of choroiditis of any degree of severity almost always destroys the overlying retina. Choroiditis can also be caused by infection from the head—tonsils, sinuses, or teeth—as has been mentioned.

A word should perhaps be said concerning glaucoma. This disease occurs chiefly in those beyond fifty years of age but can occur at any age. It varies from the most quiet chronic types with no pain, to the most acute and violent with most intense pain. The more severe the process the more apt is the pain to be located in the eye. There are many chronic cases, however, where the pain may be in the forehead or even reflected to other parts of the head. It always occurs in the same manner, usually at the end of a day's work when a certain amount of fatigue is present.

The retina is a very highly specialized form of nerve tissue and has a rather peculiar list of susceptibilities. Perhaps the most important is the retinitis which accompanies chronic kidney disease. It is always a late symptom and the exudates are distributed in a "star" shaped figure

in the macula. This appearance is always characteristic; and yet, on the other hand, Bright's retinitis may assume other forms—in fact the retinal spots may be scattered on the outlying parts of the fundus and be very small and inconspicuous. Any form of retinitis occurring late, as it does, in chronic nephritis is of very serious prognostic import. It seems to indicate severe toxic saturation, and the patient frequently dies in from three to six months after the onset of the retinitis. Hemorrhages in connection with the retinitis are generally considered to add to the gravity of the prognosis as they indicate vascular disease. I do not wish to make the bad prognosis too sweeping, as I have seen a typical case arrested by careful general treatment, and now—three years after the onset—the patient seems to be holding the kidney process; at least she is not getting worse rapidly and the retinitis has cleared up, with restoration of vision to normal in one eye.

There is also another type of cases in which the typical albuminuric retinitis occurs, and that is the kidney attacks of pregnancy. These attacks come on late and occur in those who have never had any indication of Bright's disease. They go on rapidly to uremia, and if not interfered with promptly may be fatal in their results—or at least very destructive to the retinal tissue. They generally require the induction of labor, after which the retinitis clears up with great promptness and in many instances normal vision is restored. While complete recovery is the rule in those who have previously been free from kidney inflammation, some internists think that deterioration occurs in a fairly large percentage of the Bright's retinitis of pregnancy cases; and that if they can be followed up for several years, recurrent kidney attacks will be found to have occurred.

Retinitis in a rather characteristic form occurs late in diabetes; while it was never considered a serious symptom, as was the retinitis of chronic nephritis, it nevertheless was apt to be followed by a fatal termination of the disease

in from one to two years. Insulin, however, has changed all this. Even cases with a marked retinitis can go on much longer than was formerly the case—how much longer, I cannot with certainty say. They do not succeed in absorbing the exudates and, as a rule, the vision stays below normal.

Retinitis also occurs in focal infections from the tonsils, sinuses, or teeth, as has been mentioned. The ophthalmoscopic diagnosis under these circumstances is a very important one.

Hemorrhage in the retina is a very important condition from both its local and general significance. If it is caused by arteriosclerosis, other signs of vascular degeneration are apt to be present—tortuosity of the vessels, “beading” of the arteries, peri-vasculitis, etc. If these signs are absent, and particularly if the individual is in good health, with normal blood pressure, etc., we may have reason to assume that the hemorrhage was of accidental origin—which usually means a rise of blood pressure from some unusual strain. Hemorrhages occur in the retina also as an accompaniment of a retinitis. The hemorrhage is often the most conspicuous feature, but a careful search should also be made for inflammatory exudates, areas of edema, and other signs of a plastic inflammatory process. The hemorrhages are the natural accompaniment of such a process.

I should like, in this connection, to say a few words on a much vexed question—the use of the ophthalmoscope by the general practitioner. It is undoubtedly important to avail ourselves of all possible means of diagnosis, and if the general practitioner could be well taught in ophthalmoscopy and could have enough experience to analyze what he sees in the fundus of the eye, much information of value could be obtained. The eye-ground is often a very good barometer as to the condition of the circulation and nervous system, and certain toxic and digestive changes at times give very important indications. However, ophthal-

moscopy is not to be learned in a day, and a vast amount of clinical experience is necessary to make one's opinion worth anything at all. There is a tremendous variation in the normal, and an infinite variety in the abnormal. Every ophthalmologist constantly sees absurd mistakes made by those who have only a little knowledge of the subject, and I would urge those who wish to use the instrument to advantage, to approach the subject with due reverence and to back up their opinion by large clinical observation.

The optic nerve in the main is sensitive to the same type of toxins as is the retina. Optic neuritis may be caused by syphilis, acute infectious diseases—of which meningitis is the most common—certain digestive toxemias, focal infections from the sinuses or tonsils, etc. The form of neuritis from disease of the sphenoidal sinus is perhaps at times due to a direct extension of the process through the bone into the nerve. Practically all forms are exceedingly dangerous to vision. The optic nerve is a highly specialized and delicate tissue, and if the inflammation be not relieved quickly, tissue destruction going on to serious damage to vision, if not to actual blindness, is the result.

One special form of neuritis deserves particular mention—the so-called alcohol and tobacco amblyopia. This is really an inflammation of the papillo-macular bundle of the optic nerve, the most highly specialized part and therefore the most vulnerable. This was demonstrated by de Schweinitz from autopsy specimens some years ago. It usually occurs from alcohol and tobacco in combination, and seems to depend on digestive or fermentative disturbances caused by the ingestion of large quantities of both articles. There is an impression among the laity that if whiskey or other alcoholic drink that is free from impurities is taken, no bad effects are to be apprehended; but it is certain that the disease has been caused by absolutely pure products. Poisoning by methyl alcohol, etc., does not cause this type of disturbance. It can also occur with tobacco or alcohol alone. For some years it was

doubted that tobacco alone could cause a neuritis, but a number of cases have been reported where it seemed fairly certain that alcohol had not been taken. It usually occurs in cigarette smokers who inhale and who have a cigarette in the mouth during most of their working hours. The tobacco cases are less stubborn than the alcohol ones, but are sufficiently dangerous to vision and will go on to absolute blindness unless relieved. The attack is usually quite rapid in its onset. The patient wakes up in the morning with a dense whitish blur in the line of direct vision and a total loss of color perception when an object is looked at directly, though the outer parts of the field may still perceive some colors. Ophthalmoscopic examination shows only slight appearances of neuritis, or perhaps none at all at first. In other cases, the failure of vision may come on more slowly, but this is rather exceptional and depends on the ability of the patient to burn up the alcohol. Chronic habitual alcoholics are a little more apt to have a slow onset. The prognosis is relatively favorable, but of course all alcohol and tobacco must be withdrawn, and the intestinal tract must be energetically treated by diet, irrigations, cathartics, etc. Strychnine in doses up to the limit of toleration is also valuable. A rather curious impression has occasionally been brought forward: that those who have recovered from an attack are more or less immune. While it is certain that in some cases smoking and drinking have been resumed without damage to vision, it is most probable that they have been resumed in much smaller quantities; also there are plenty of instances where drinking has been resumed in large quantities and where the patient has gone blind through recurrent attacks. It is very doubtful if any real immunity exists, and in any event it seems wiser not to test this point.

Methyl alcohol has been mentioned. This, however, does not cause a definite neuritis, but quite a different process. The patient who has taken enough methyl alcohol becomes rapidly unconscious and the optic nerves become pale, with contracted vessels, and most commonly go on to total

atrophy and complete blindness. The same thing happens in poisoning from a large dose of quinine. What usually happens is that one or two teaspoonfuls is taken by mistake for a dose of salts. The patient becomes unconscious, and when he recovers the optic nerves are white, with small vessels and the patient is blind. He rarely recovers, though vigorous eliminative treatment, followed by full doses of strychnine are usually given. All sorts of attempts to secure dilation of the central vessels have been made, but they seem to have little effect.

Choked disc or papilledema is a process in the optic nerve that requires special mention. It is often confused with neuritis by the use of names like "papillitis," which should be applied only to a plastic or inflammatory process. Essentially, it is a choking of the lymphatics by some disturbance in the base of the brain near the ventricles, which dams up the fluid in the optic nerve and causes also a distention of the subdural and subarachnoid spaces in the sheath of the nerve just back of the eyeball. There are no plastic exudates and no depression of vision until the process has lasted for some weeks. It is invariably caused by increased intracranial pressure with obstruction to the basal lymph circulation. As increased intracranial pressure is almost always caused by a neoplasm, so it follows that choked disc usually means brain tumor with obstruction of the basal circulation. Thus a tumor of the cortex does not cause choked disc until the process extends so as to involve the base. The diagnosis with the ophthalmoscope is therefore very important. It is not difficult in the typical early cases; whereas later the picture may be very confusing. I was fortunate enough once to see a case the day before the onset of the edema when the nerve was normal, and the very day of the development of the edema—the day following, when the nerve looked as if a drop of water had been injected into it with a hypodermic needle. The next day it thickened and became slightly opaque; and soon it became swollen with tortuous and distended vessels. The vision did not decrease for a month, however. This case

was explored and found to have an inoperable glioma, as is too often the case. The diagnosis rests on the normal vision, markedly swollen nerve, with tortuous vessels and perhaps hemorrhages and the absence of plastic exudates in the early stages; whereas in neuritis the nerve is red and hazy, with less marked swelling, perhaps none at all and plastic exudates on its edge and extending over on to the retina. When a neuritis begins, the vision at once falls off rapidly, and if the neuritis be not checked a secondary atrophy of the optic nerve with greater or less damage to vision is the result. Choked disc cases often require a cranial decompression which relieves the optic nerves but has little effect on the underlying tumor.

All sorts of curious functional changes take place in the eye as the result of instability of the general nervous system. These changes vary from the simple muscular irritability of those who can never tolerate any change in co-ordination and who have muscular aches and even cramps whenever a change is made in their glasses, to the absolute cessation of function seen in an external muscular paralysis or even the condition known as hysterical blindness. Any of the external muscles may be affected, 3rd, 4th, 6th nerves, levator of the lid, or the pupil. A very suggestive condition is that the paralysis is incomplete and does not follow the complete distribution of the nerve. Scotomas or spots in the field of vision occur and are usually not in line with the normal distribution of the fiber bundles. For instance, the upper half of the retina may fail to function; whereas, without retinal disease failure of function due to a cerebral hemorrhage would be a lateral hemianopsia, or in accordance with the normal distribution of the fibers. In fact, inconsistency is one of the most striking signs of a hysterical disturbance. In an eye that is blind and cannot see light from hysteria, if the light be thrown on the pupil it will contract normally. Also, the signs of emotional instability are striking and suggestive. Many such cases who have a very patient, long-suffering aspect, will blaze out into fits of temper if irritated. The so-called globus hys-

tericus may also be found, and the patient will complain of a choking sensation in the throat on the least provocation. Also other hysterical manifestations may be present.

Hysterical cases always are influenced by methods of suggestion but the suggestion must have some basis of reason. In other words, it is not sufficient to tell a hysterically blind person that she can see, but some drops must be used, or glass used which is supposed to influence vision. While such cases may last indefinitely, they usually yield in a short time if the patient's confidence can be gained. Of course, a sharp look-out should always be kept for true organic conditions, for it is quite possible for a hysteric to have an organic lesion. It is bad enough to mistake a hysterical condition for an organic one, but far worse to mistake an organic lesion for hysteria.

SPECIFIC SENSITIVENESS AS A CAUSE OF SYMPTOMS IN DISEASE

(ESSENTIAL HEMATURIA AND LOCALIZED RETINAL EDEMA
AS POSSIBLY ALLERGIC SYMPTOMS.)

ARTHUR F. COCA

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Since the day of Virchow the physician has arrived at the understanding of disease and the art of healing through the study of more and more of what, from the standpoint of medicine, are called the basic sciences—biology, botany, histology, histo-pathology, chemistry, physiology, pharmacology, bacteriology and finally immunology.

It is interesting and somewhat amusing to recall the opposition on the part of its immediate predecessor to each new science as it endeavored to win separate recognition in the medical field, both in the colleges and in extra-collegiate medical organizations.

There may be some still living who remember the reluctance with which the subject of pathology was relinquished to specialists by the medical internists. Many may still smile at the efforts of the pathologists to maintain their hold on bacteriology and bacteriologists.

And to-day the immunologist hardly knows whether he exists or not. Yet the subject of immunology, although based on the single phenomenon of the specificity of the antibodies has grown to such importance and dimensions and has so increased in complexity that it requires and deserves the full attention of anyone who would master it.

We are met here to discuss one category of a group of pathologic conditions which may well be referred to as immunologic diseases.

The course of the science of immunology has been surprising and indeed paradoxical. It began with observations upon immunity to infectious disease which were immediately applicable to the protection of man and the lower animals. It next discovered the antibodies which were protective (that is, antitoxins) and others (the agglutinins and precipitins) which were of great value in diagnosis but of no significance to immunity to infectious disease. Then came the astonishing paradox in the discovery by Landsteiner that antibodies are not only not always protective but are sometimes the actual cause of disease. Landsteiner demonstrated that the cause of paroxysmal hemoglobinuria is the presence of an antibody (an auto-hemolysin) in the blood of such subjects, which is capable of destroying the individual's own blood corpuscles if the surface blood becomes chilled to a certain critical low temperature. This was the first demonstration of an immunologic disease.

To-day I have to speak about the other category of immunologic diseases, some of which have been proved to be due to antibodies—the diseases of specific sensitiveness.

By way of introduction of this topic I should like to recall briefly the basic features of specific sensitiveness so far as our knowledge of the subject at present permits.

These are: first the specific mechanism and secondly the shock organ and shock tissue.

The specific mechanism of hypersensitiveness has been demonstrated in only two forms; that is, in anaphylaxis in the lower animals and in the atopic or inherited group, which includes hay fever, bronchial asthma and eczema. The specific mechanism of anaphylaxis is the anaphylactic antibody; that of atopy is the peculiar antibody known as the atopic reagin.

Among the more striking differences between these two antibodies is the fact that the anaphylactic antibodies can sensitize the unstriated muscle of lower animals but not

the human skin, whereas the atopic reagins can sensitize the human skin but not unstriated muscle.

The shock organ in anaphylaxis is different in different animal species but it is the same in every individual of the same species. The shock tissue of anaphylaxis in all lower animals is usually unstriated muscle. In the guinea pig it is the bronchial muscle, which contracts tetanically under the antibody-antigen reaction and thus causes death by respiratory asphyxia; in the rabbit it is the medial muscle of the pulmonary artery whose tetanic contraction under the influence of the antibody-antigen reaction causes death by circulatory asphyxia; and in the dog it is the medial muscle of the hepatic vein whose contraction causes a fall in the systemic blood pressure, which is made fatal by a coincident widening of the systemic capillary bed.

These differences in the site of the anaphylactic reaction in the different species are due to anatomical peculiarities. The unstriated muscle in the three sites mentioned above is equally susceptible in the guinea pig, rabbit and dog, to the antibody-antigen reaction; they all contract in those situations; but the bronchioles are not closed in anaphylactic shock in the rabbit and dog because the bronchial muscles in those animals are relatively too weak to constrict the heavier walls, and for a similar reason the pulmonary arterioles are not constricted in the guinea pig and dog, and the hepatic veins are not occluded in the guinea pig and rabbit.

Although unstriated muscle seems to be the only shock tissue involved in acute anaphylactic shock, there is probably another tissue in lower animals in which anaphylactic antibody-antigen reaction causes a physiological response.

This appears to be indicated by the fact that cutaneous injection of the antigen in the anaphylactic lower animal causes edema and sometimes necrosis—stages of inflammation which seem not to be due to any primary action on or by unstriated muscle. This type of lesion is not produced

when the antigen is injected otherwise than locally or if it is absorbed after ingestion or inhalation.

In the lower animal the shock tissues are normally susceptible to the irritating influence of an antibody-antigen reaction. This is proved by the passive sensitization experiment which is successful in 100 per cent of normal guinea pigs.

In the human being the shock tissue has not been definitely identified. However, it seems probable, that it is not unstriated muscle because that tissue in the guinea pig can not be sensitized with the atopic reagents.

The shock organs or sites in which the physiologic reactions of human hypersensitiveness may take place are numerous. Thus we recognize the conjunctiva, the nasal mucous membrane, the bronchial mucous membrane, the gastro-intestinal mucosa, the skin and the subcutaneous tissues. Undoubtedly there are other sites and these possibilities will be discussed presently.

With the remarkable exception of the skin, the human shock-organs that are subject to the inherited category of hypersensitiveness are not susceptible in the normal person to the reagin-antigen reaction. This is shown in the fact that in many persons, in whom reagins have been demonstrated in ample quantity, contact with the respective antigen, either natural or by injection (Walzer and Brunner) has not been followed by any reaction on the part of the atopic shock organs; and this evidence is supported by the common observation that, whereas two persons may be sensitive to the same substance (for example, a pollen) and both carry the same reagin in their blood, one of these may suffer only symptoms of hay fever, and the other only those of asthma.

Thus it is clear that the shock organs of atopy are in an abnormally sensitive or atopic state, which is subject to the atopic hereditary influence. Moreover, there is evidence of a separate hereditary influence upon the shock organs

in the fact that the hypersensitiveness of hay fever tends to be transmitted as such to the affected child rather than as asthma, and vice versa.

The characteristic primary lesion of atopy is congestion with edema; this is seen by direct examination in hay fever, in urticaria and angioneurotic edema, and in bronchial asthma; and one may surmise that the same lesions are present in gastro-intestinal idiosyncrasy.

The question naturally arises: how does the antibody antigen reaction in specific sensitiveness irritate or injure the shock tissue? Most of the study which has been given to this question has been directed toward the finding of a hypothetical poison (protein poison, anaphylatoxin) which could be identified as the ultimate injurious agent; and most investigators of the question have sought the poison in a split product of the antigen. However, this idea has met with two difficulties: first, that the minimal lethal quantity of the usual antigens contains but a small fraction of the lethal quantity of its most poisonous derivative, histamin, and secondly, that an incubation period, which must be required for the splitting process, is missing.

The well-known recent researches of Lewis and his co-workers, and of Dale, have given support to the idea that the antibody-antigen reaction liberates the loosely combined histamin, which Dale could demonstrate in normal tissues, and that this histamin is the ultimate poison of specific sensitiveness.

There are some facts which offer serious objection to the universal application of this theory in all the phenomena of specific sensitiveness. One of these is the difference in the character of the different cutaneous lesions of hypersensitiveness; another is the specificity of the protection induced in hay fever by the injection of pollen extracts. Neither of these two considerations is, on its face, in harmony with the histamin theory of Lewis and Dale, because the former makes necessary an additional assumption that histamin is capable of causing different lesions in the same

tissue, while the latter proves that the tolerance developed under the specific treatment for hay fever is not induced against the non-specific effect of histamin.

Let us now return to the stated subject of this lecture, which is Hypersensitiveness as a cause of symptoms of disease.

From what has been already said it is seen that a discussion of this subject must resolve itself into a consideration of all the possible sites that may be injuriously affected because of the state of hypersensitiveness. Some of these have been mentioned:

The *conjunctiva* is sometimes, though not always, affected in hay fever. It is a remarkable fact that even when, under the influence of specific treatment for hay fever, the conjunctiva is no longer affected by the normal contact with the pollen during the hay fever season, it may exhibit the same degree of sensitiveness to the pollen extract by test as it did previous to the treatment.

The *nasal mucous membrane* is the chief "shock organ" of hay fever; the symptoms of this condition are too familiar to need mention. They may be caused by many other excitants beside the pollens though by far less frequently.

The *bronchial mucous membrane* is the shock organ in asthma. Direct examination of the mucous membrane in this condition has revealed edema without constriction. The sudden attacks of severe dyspnea have been ascribed to spasm of the bronchial musculature. This explanation is contradicted by the inability of the reagins of asthma to sensitize unstriped muscle in the lower animal.

Huber and Koessler report that the bronchial muscles are hypertrophied in the asthmatic lung and they conclude from this finding that the asthmatic attack is due to bronchospasm. Aside from the question whether bronchospasm occurs in asthma it would seem desirable to control the finding of Huber and Koessler by similar examination of

the bronchial musculature in other chronic pulmonary disease, especially chronic bronchitis and tuberculosis without asthma.

The *skin* is the exclusive shock organ in two different forms of specific sensitiveness: in atopic eczema and in specific dermatitis (dermatitis venenata) and it takes part in the hypersensitiveness of infection of the tuberculin type and also in atopy, in serum disease and in food and drug idiosyncrasies, in the development of urticaria and other eruptions. The pathology of these various reactions is different, but the cause of these differences has not been studied.

Certain *gastro-intestinal* symptoms of specific sensitiveness are well recognized; those of nausea, vomiting, gastric and intestinal pain and diarrhea. The underlying pathology of these symptoms has not been studied because they so seldom result fatally.

The *sub-cutaneous* and *sub-mucous* tissues participate in serum disease and in food and drug idiosyncrasy. The localization of these lesions which is seen in serum disease and in some instances of angioneurotic edema has as yet no explanation.

There are a few other symptoms, some less common, for which there is acceptable evidence of a hypersensitive nature.

W. W. Duke has reported a case in which *bladder pain* was caused by the ingestion of tomato or the subcutaneous injection of an extract of tomato.

W. L. Beecher reports three instances of canker sores in the mouth which were caused by cocoa, in one case, wheat in the second and cocoa, wheat and cabbage in the third. The lesions could be elicited at will by the ingestion of the respective foods.

Matthew Walzer allows me to mention an unpublished instance observed by him of canker sores caused by the oil of cinnamon contained in the mouth-wash Lavoris.

Baagoe reports a case of recurrent herpes of the face caused by eating crab meat.

To W. T. Vaughan is due the credit for the demonstration of the allergic nature of migraine. As Vaughan remarks, the idea has been entertained before, but only as a theoretical basis for the application of those non-specific therapeutic measures which had been used with some success in the recognized forms of human hypersensitiveness—asthma, urticaria, angioneurotic edema, eczema, hay fever (Auld, Storm van Leeuwen, Widal, Radot).

Vaughan, in 1927, reported 10 cases of migraine (out of a series of 33) in which specific sensitiveness to various foods could be shown and which were "cured" by mere avoidance of those foods. Attacks of migraine could be precipitated by the accidental or experimental ingestion of the respective materials. Vaughan describes a delayed cutaneous reaction occurring six hours after the skin test had been made; he attaches a special diagnostic significance to such reactions in migraine.

Corresponding with the large proportion of failures in the specific treatment of asthma, the avoidance of the foods causing skin reactions in the subjects of migraine failed to relieve ten of the 33 cases observed by Vaughan.

In the following year Berg reported an instance of migraine which he proved to be due to the inhalation of the vapor of coal tar.

The pathology of migraine is not known because death does not occur during an attack; however, the lesion may be assumed to be intracranial and may be found to be a localized edema affecting the meninges.

All of the shock organs and tissues and allergic symptoms that have just been mentioned have been identified as such by one or more of the following criteria:

- (1) By eliciting characteristic symptoms or lesions upon applying the excitant directly to the part.

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- (2) By observing the constant appearance of the characteristic symptoms or lesions after normal contact with the excitant (as by ingestion or inhalation of it).
- (3) By the appearance of characteristic symptoms or lesions following the injection of the excitant.
- (4) By the disappearance of the symptoms or lesions upon the avoidance of the excitant.

The evidence under the first three criteria has, of course, been controlled by negative results of the same tests in normal persons.

Now although all of the organs mentioned have been identified as shock organs of specific sensitiveness, there are many instances of clinically typical hypersensitiveness involving one or more of these sites for which no specific excitant can be found. Furthermore, it is well known that the shock organs in sensitive individuals are often susceptible to non-specific influences. This fact is perhaps most clearly apparent in the non-specific reactivity of the skin in many atopic persons to intracutaneous injections.

These circumstances can hinder the effort to prove the hypersensitive nature of the less common symptoms of hypersensitiveness by making impossible the application of the three criteria for their recognition, which have just been mentioned. One cannot experimentally induce the symptoms of specific sensitiveness unless one knows the specific excitant of them.

However, there is indirect evidence of three kinds which sometimes supports a presumption of the hypersensitive nature of otherwise obscure lesions or symptoms. One of these is a personal or immediate family history of recognized idiosyncrasy; the second is the seasonal appearance and disappearance of the lesion; and the third is the disappearance of the lesion during a period of the affected person's absence from the customary environment.

It is clear that such evidence cannot be accepted as con-

clusive on the basis of one or two cases; but, as the number of similar cases increases, the accumulated evidence from them, if consistent, will be viewed with greater confidence.

With these reservations in mind, I may describe a case that exhibits two symptoms which I believe have not been considered heretofore as phenomena of hypersensitiveness, and which occurred, in this instance, in circumstances that suggest such an interpretation. The symptoms were those of so-called idiopathic or essential hematuria and localized edema of the retina.

The case history follows:

Family History:

Epilepsy, hives, migraine on mother's side; no asthma, hay fever nor eczema on either side.

Personal History:

Hives at 12 years; indigestion from 17th year greatly improved after gastroenterostomy and one year in a tropical country, but recurring soon after return to the United States, and then practically cured by avoidance of certain foods—especially lemon, corn starch, gelatin (commercial), strawberries, eastern peaches. One tea-spoon full of fresh strawberry juice causes "heart burn" within two to three hours. Lemon rind (two tests) causes acute gastritis (severe pain without nausea, fever, headache—different from migraine) lasting three days. Limes, oranges, fresh or in marmalade, grape fruit cause no symptoms.

Migraine beginning at the age of 27, the attacks increasing in frequency and severity till middle life, and rapidly lessening after the age of 45. No attacks during ten months in the Philippines at the age of 34.

In the early summer of 1922 a sudden clouding of vision of the left eye appeared which completely disappeared in the late fall and reappeared in the following spring. The ophthalmologist found an edematous area in the left macula as the sole lesion. During the next winter the spot cleared completely, to recur in the spring. In July, that year, a trip was taken to Panama. One week out of New York the vision in the left eye had cleared completely and remained so till about 10 days after the return to New York, when the cloud began to be noticed again. This lesion still persists and while it is not so intense in the summer as at first it does not entirely disappear during the winter.

On March 18th, 1924, there was a sudden hematuria without pain. The urologist found the bleeding to be from the right kidney. The function of both kidneys was normal; urine cultures were sterile; pyelograms of

both kidneys revealed only a constriction in the upper portion of the right ureter. This was widely dilated during the next few months. The later pyelograms showed no abnormality. On May 3rd, 1926, hematuria recurred but with less blood than at the previous occasion. Again no pain. Sodium bicarbonate was taken at frequent intervals during the next day and by the third day the bleeding had stopped. There was no examination at this time or later. The scotoma in the left eye was noticed on this day for the first time that year.

In the fall of the same year there was a severe attack of urticaria lasting several days.

On April 23rd, 1928, a tarry stool was passed and blood pigment was demonstrated in it. There had been no gastric or abdominal pain nor other abnormal symptoms. The hemorrhage did not recur. Fluoroscopic examination immediately after the hemorrhage and a complete examination at the Mayo Clinic in the following November revealed no organic lesion.

The general health of this subject has visibly improved during the subsequent two years. Weight increased from 147 pounds to 163 pounds.

I have learned of another instance of essential hematuria occurring under circumstances similar in important respects to those of the case just described.

Family History:

The antecedents on both sides are long lived and healthy; asthma and hay fever absent on both sides. Mother has suffered long from eczema, and has frequent attacks of urticaria; is subject to chronic arthritis.

Personal History:

Subject to eczema on hands and feet which breaks out each year in June and tends to heal during the winter. Formerly had "cold sores" on the lips every summer. Exhibits a sensitiveness to sunlight in the formation of bullae, limited to the nose 48 hours after exposure to direct sunlight in the summer time.

In June, 1900, blood appeared in the urine and persisted till November. There were no other symptoms. In June, 1901, hematuria recurred lasting a few weeks. A third short attack occurred about 12 years later also in early summer. In the fall of 1924, the usual typhoid vaccine injections were taken and the third dose caused a severe local and general reaction. At the same time hematuria recurred lasting a short time.

The facts in these two cases do not prove the hypersensitive nature of essential hematuria and of localized edema of the retina; nevertheless they constitute a reasonable

ground for considering both of these conditions as possibly allergic.

There is a long list of other conditions that have been thought to be expressions of a hypersensitive state but the evidence in these instances is not convincing.

Another important condition has been considered from the point of view of hypersensitiveness but the published opinions are heavily against that interpretation; I mean the condition known as epilepsy. The reasons for this adverse opinion are perhaps: 1. because epilepsy is known to be caused in some instances by pressure of bone upon the brain, 2. because epileptiform seizures are known to affect lower animals.

Nevertheless, there are two considerations which speak for the allergic nature of epilepsy; one is the fact, well known since Hippocrates first noted it, that the characteristic meningeal lesion of that condition is also a characteristic lesion of allergy, namely, edema, and the other is the observed hereditary association of epilepsy with migraine.

Redlich has reported a case of migraine in which the attack sometimes developed typical epileptic characters (unconsciousness, convulsive movements, bloody foam in the mouth).

In conclusion I would recall that many of the important human organs have been identified as shock organs of hypersensitiveness. In fact every medical specialty is obliged now to take cognizance of the lesions of hypersensitiveness that come within its province and must therefore, become familiar with the immunologic principles concerned in the etiology of those lesions in order to understand them and to treat them rationally.

DRUG ADDICTION

ALEXANDER LAMBERT

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The New York Academy of Medicine.*

If one considers the subject of drug addiction from a broad medical point of view, it will be readily seen that confining the condition to the use of the opium derivatives is altogether too narrow a conception to be of any real medical value.

Drug addiction is best defined as the habitual use of any drug taken for the purpose of avoiding the emotional strains of life. It is the habitual use of a drug, to obtain a balance in the personality whenever it seems impossible to adjust the problems of existence without temporary relief.

Trotter expresses it extremely well when he says that the intoxication and narcotic impulses have been almost universally regarded on the one hand as a sin or a vice, on the other as a disease, but there can be little doubt it is essentially a response to a psychologic necessity. In the tragic conflict between what man has been taught to desire, and what he has been allowed to get in life, man has found in alcohol, as he has found in certain other drugs, a sinister, but effective peace maker.

Probably the mildest form of drug addiction is shown in the habit of taking hypnotics; here it is, that the worries of life, the unsolved problems which prevent sleep, are the expression in the mildest form of the wear and tear of life, which with its worries, prevent rest and recuperation which we expect each day to obtain, when the day's work is done. The average person can face life fairly well, provided that he may obtain a night's sleep, and temporary relief by forgetfulness. With the daylight his courage returns, and many hundred years ago, the psalmist realized it, when he said, "Help cometh with the morning." and knew that daylight would bring a change of subject in his mind when the day's work began.

Probably chloral hydrate is the oldest hypnotic used for this purpose, which has had a wide use, and carried with it its habit forming peculiarities. It is a very satisfactory drug to produce natural sleep, from which the patient wakes naturally, and easily drops to sleep again, without the annoying period of lying awake, and in the morning feels relaxed and refreshed. One or two generations ago it was a drug which had many devotees in chronic habit form, and was a habit which was difficult to break, because at that time the profession did not understand the psychologic basis on which the habit was formed.

It causes a reduction of blood pressure, it produces a very comfortable sleep, but in elderly people it has the curious property of causing sleep walking, during which the patients are able to awake partially, but do not separate their sleeping from their waking consciousness, and they are apt to act in an automatic manner, get up, and move about their rooms, or run up and down the hall half awake, and half asleep, apparently acting out their dreams in a very disturbing manner, disturbing, however, more to their family, and their attendants than to themselves, for frequently the following morning they have absolutely no recollection of the trouble they have made, and insist that they have had a comfortable night. Its action on a heart already diseased however, is not without danger, and therefore it may be treacherous, often when its benefits are needed the most.

It has been most frequently used combined with the bromides, but now that we can more accurately gauge the psychic differences in the average normal of the patient, we can readily see that chloral alone, or with bromides, and sometimes bromides alone, if continued any length of time, produce a deterioration in the normal judgment of the patient, and even delusions, which makes them inaccurate in their statements and ideas, and if persisted in, may go on to a distinct drug psychosis.

The next group of drugs used as hypnotics was the trian-ol and sulphonal group. The danger to those who indulged

in these, was a muscular incoördination on the day following, and if persisted in, there was a distinct deterioration tending towards the dementia type.

The most common hypnotic to-day is the barbituric acid group; it began with veronal; it has run through a large number of hypnotics, each chemist endeavoring to make a substitution in the chemical constitution that would leave its hypnotic powers intact, but cut out the very evident evils of perversion of personality, which these drugs show.

Veronal in many instances is an evil drug, and drug psychoses with hallucinations, delusions of persecution, and an ugly resentful distortion of personality, are common after its excessive use. In the mildest intoxications it leaves patients ill natured, sharp tongued, suspicious, and mean tempered, giving them a reputation for meanness of disposition which seems so natural that people do not recognize that it is the poisoning from a drug, and the personality of the unfortunate patient is blamed for the perversion. Veronal is not infrequently used with suicidal intent, and large doses of it produce coma lasting many days, from which it is difficult to arouse the patient, and when a psychosis is thoroughly established, it takes weeks, if not months to bring about a recovery under the best conditions of institutional care.

The different forms of this group, such as the dial ciba, allonal, medinal or sodium veronal, the barbital, etc., all have their advocates and in carefully adjusted doses, under usual circumstances, when taken for temporary emergencies, they do not produce a harmful reaction, or if an individual is sensitive to it, the symptoms produced soon subside. It is the wide spread unrestrained use that is harmful to the community, and the unrecognized necessity of this form of drug addiction is the expression of the psychologic maladjustment of the wear and tear of life, produced by the worries and unsolved problems that force patients to turn to these addictions.

This does not seem to be generally recognized by the medical profession, and many chronic drug intoxications are not recognized. The treatment of this problem lies in the emotional training of the patient, not that all worries and problems of life can be solved by the physician, but the solution lies in forcing individuals to solve their problems, and realize that the solution is obtained only by facing it, and not by dodging it. Not that all marital misfits can be solved, even by the facing of the fact, nor that all petty annoying self centered selfishness can equally be re-arranged, but the fact that the situation is faced, and that the incessant use of hypnotics is used to dodge all this maladjustment is realized means that many patients that now go untreated, and become poisoned, would be relieved of their worries and their drug addictions.

The problems which seemingly defy solution, are met with in the narcotic addictions to alcohol and opium; both these drugs are narcotics, and are used for their narcotic value, and the fundamental basis of alcoholic drunkenness and morphine addiction, is essentially the same. The alcoholic who periodically drinks to forgetfulness, does it on the same psychologic basis that the morphinist does who takes his drug habitually, to dodge the bitter disappointments and unhappiness of life, or the responsibilities which they are unwilling to face. It is not a question of will, it is a question of emotions, and when the emotions in the personality are too bitter, and too intense to be harbored, temporary relief, or permanent relief is sought in alcohol, or permanent relief is obtained in morphine to balance a maladjustment which cannot otherwise be borne.

Alcohol produces in itself, when taken to excess, changes in the essential parenchymatous cells of certain viscera, and in the destruction of these, there is left behind a connective tissue replacement. It therefore leaves a permanent injury behind its excessive use.

Morphine, on the other hand, though indulged in for years, is a functional cellular poisoning, and leaves no recognizable pathologic injury, and when taken away, and

the nervous tissues which were poisoned are given time to recover, they come back to the condition in which they were before the poisoning began.

A morphinist, therefore, after many years of poisoning, can return to his average normal, but an alcoholic having suffered the morbid processes of a Korsakoff syndrome is left with a personality, the finer emotions and values of which are hopelessly burned out, and that personality never regains its former charm, and previous sense of values.

The habit indulgence in these two drugs has been almost universally looked upon as moral degradation, but curiously enough in those countries in which the indulgence in one is more or less condoned, the other is condemned, while in other countries the reverse is true. That is, in the Western nations, and in Japan, alcoholic indulgence is condoned, morphine addiction is condemned; in China, India and the East opium is condoned, and alcoholic indulgence is condemned. The morals therefore, however strictly enforced in any one country, vary in others regarding these narcotics; it is therefore custom and convention which control, and each country condones the use of some narcotic to unhappy humanity, but sternly regulates which one shall be chosen.

The use of both these narcotics has come down to us from ancient, probably prehistoric times, and both have been used for centuries in medicine, opium coming to us from that brilliant Arabian culture of the middle ages.

Alcohol is used the more often of the two to cut off emotional inhibitions, and the feeling of restraint which prevents freedom of speech and action, which otherwise the normal self control would restrain, or custom and convention inhibit. This is seen by its universal use in youth to cut off inhibition, that their emotional life may be enjoyed and lived more fully. Youth learns readily that in alcohol there is an easily accessible substance that quickly removes the sense of responsibility, and quickly gives relief from restraint, and the wear and tear of life. Later

when the worries and struggle of life bear too heavily on them, and the personality, as middle age is reached, can not carry the strain of existence, alcohol is known to be the quickest acting narcotic, producing a temporary relief in consciousness, and its excessive use will probably be condoned. Age, however, uses it to forget, and obliterate the failure of one's hopes, and the defeat of one's cherished plans, and the memory of the overcrowding bitterness of life.

Morphine, on the other hand, is used by those who begin life with inadequate personalities; those whose environment has forced on them a bitter realization of poverty and lack of opportunity, and in whom the struggle for existence seems in the very beginning a hopeless fight against forces too great to be overcome. It forms in that type of inadequate personality in their youth, a balance that enables them to muddle along in an existence, the bitter edge of which is blunted.

In many of the morphine addicts to-day, this evidence of inadequacy of personality is the striking feature that crops out in any endeavor that is made to help them. The majority of them show that tendency towards dementia precox which brings with it the peculiarity that they never can get in touch with existence in such a way that their problems can be solved. Not that they are insane, but their intelligence however keen, does not control their actions. Although they may be sufficiently intelligent to succeed in life, their actions spring from uncontrolled emotional stimulation, and when their minds are filled with antisocial resentment, they fall easy victims to the chronic indulgence of the opium group. The solution of their problems at times appears fairly hopeless, because they fundamentally have no desire to reconstruct themselves, and there is no coöperation on their part for such reconstruction.

Morphine addiction is often acquired in the justifiable struggle to obliterate physical pain; many of these patients acquired it through legitimate use, under legitimate med-

ical prescription against sickness, and physical suffering. Public opinion in this country unhappily does not make any difference in the condemnation of these unfortunates, but classifies them all in the psychopathic class of those who are unwilling to face existence. In the care of these, as we shall see, there is a vast difference in the prognostic outlook for the successful elimination of their habit. This class wants to be free, and if given the opportunity remains free. It is the unhappy psychopathic group with maladjustment of their existence, and malformation of their personality, which are the difficult ones to help.

Considering the alcoholics as narcotic drug takers, for such they are, they show distinctly two types of alcoholic excess.

Youth, in the vast majority of instances, as we have said, drinks to enjoy life more abundantly; uncertain of themselves; ignorant of racial experience, and lacking in the experience of life, vigorously resenting all authoritative restraint, alcohol is used by them to inhibit all such restraints, to blot out all realization that they do not know, and they are determined to experience for themselves the full emotional rush of life, without intellectual inhibition, believing that they can answer their questions and solve their problems more fully by so doing.

In youth imagination and emotions enormously predominate over intellectual processes, and over the controlling influence of judgment, for judgment, the most valuable of mental attributes develops the most slowly.

Habitual drunkenness is under these circumstances not the thing desired, it occurs because youth is determined to take enough alcohol to obtain the fullest results. In the majority of instances experience soon teaches that this form of alcoholism is not the answer to life, nor the solution of its problems, and with its lack of value as such, it is, in the majority of cases, discarded.

To those, however, who cannot, or who have not been taught to, adjust their emotional balance to their environment, alcohol is an easy method of balancing a mental

deficit. It cuts off the sense of inferiority, it blunts a sense of failure, it possesses above all drugs that sense of what London called "White magic," that when under its influence, whatever we did or said, no matter how inaccurate the fact, it all seemed to be the most perfectly done, and the most brilliantly said.

Alcohol's earliest toxic effect is shown in its atrophy of judgment, and its hypertrophy of self conceit. Many individuals cannot believe how sensitive they are to small doses of alcohol; a single cocktail taken on an empty stomach shows within a short time its toxic effect, there is the mental inhibition, or there is the evidence that that personality is saying things it would have left unsaid, or doing things it would have left undone without the alcohol, and when that occurs, moderation has been exceeded, and that personality has taken an excess of alcohol, which if continued, is sure to bring harm, or injury to the mental and physical makeup of the individual.

Individuals sensitive to alcohol drift unconsciously into its habitual excess and soon if a single drink is taken, they go on to a sure excess which may end in several days' debauch. The social customs of our race have from time immemorial, interwoven with good fellowship, and not a few unconsciously drift into an excess that has an unconscious, and not a vicious origin.

By the time a man reaches the early thirties, he knows whether he can see his opportunities opening before him, whereby a determined struggle will bring him success. The determined struggles requiring hard work, application and self restraint, cannot be won with an alcoholic handicap added to them. In this period the greatest number of young men give up their alcohol, if they have been drinking to excess, but if they go on, they get into the pathologic point of view in which like older men, they drink to forget.

The older group of alcoholics, those who have been through life, and felt its failures, have been through un-

happiness and felt its burning sting, or those who having tried, and through some uncontrolled factors have failed, find in alcohol its full narcotic value, and they learn to use it for its pure narcotism. These men do not get drunk because they drink, they drink that they may obliterate consciousness, and its unhappiness, and as they return to consciousness, drink again that they may not come into the suffering of conscious existence. Alcohol has from time immemorial been life's last remaining solace to those who go down in defeat.

In treating these patients, it is useless to argue with a mind that is poisoned by alcohol, it is waste of time to try to rearrange and appeal to a befuddled intellect, hoping to rearrange the balance of the emotional control. The first thing to do with an alcoholic is to put him to sleep, and see that he sleeps quietly long enough to unpoison his nervous tissues, and free his body from his narcotic. As soon as possible a vigorous mercurial purge aids enormously towards this result. Ordinary hypnotics in ordinary doses are insufficient to deal with patients already poisoned by alcohol.

One of the best drugs is paraldehyd, disagreeable as it is with its repulsive odor on the breath in the days following; 2 drams and repeat in a half hour, if the patient is not asleep, is the moderate dose for the average patient. This drug had better be given with orange juice and a little whiskey, which takes the repulsive taste away from it, or it can be given simply with the orange juice; but if none is at hand, then it is best given in ice cold water, and this drug has the advantage of acting quickly.

Another excellent remedy is a combination of chloral, codein and hyoscyamus; 25 to 30 grains of chloral, one or two grains of codein, and 30 minims of tincture of hyoscyamus at a dose, is an excellent hypnotic; with this however, should always be mixed in prescribing it to an alcoholic, the tincture of capsicum, tincture of ginger, or some such stomachic, that will stimulate the stomach to absorb. The alcoholic gastritis is notorious for its inability to ab-

sorb medication, and the gastric mucous membrane should be invariably stimulated by some such drug as capsicum or ginger.

If we use the amount necessary to put the alcoholic patient asleep of the barbituric group of hypnotics, in my experience, when the patients wake up, they are resistant and antagonistic to any suggestion, and are not amenable to treatment. It makes them non-coöperative, and an alcoholic, feeling sick and unhappy, in an ugly resistant mood, is a disagreeable patient to have anything to do with, and there is no use adding to the difficulties of the situation by increasing the perversity of humanity. These unhappy souls are only too eager to grasp at any excuse by which they can dodge the responsibility of freeing themselves from their narcotic, and the barbituric acid group of narcotics adds to the normal obstinacy and resistance of these patients.

As to the amount of whiskey, or alcohol to be given to an alcoholic coming out of his debauch; as a general rule the quicker they are cut off, the quicker they recover, but that is a rule, and not a law. It is easier to win their confidence by tapering them off, than by cutting them off. Older men should be tapered off, but the younger the man, the more abrupt should be the tapering process.

The alleged thirst for alcohol is only exhibited in the first twelve hours after their debauch, as they are recovering. If a patient has obtained the temporary relief he sought, and is disgusted with himself, and his intelligence is beginning to control him, he is often anxious to be rid of his alcohol, and is anxious to be helped to cut it off quickly and abruptly, but most of humanity cling to their narcotic as long as they are allowed to.

Nearly all periodic drinkers, and especially women, drink from the pathologic point of view, there is something in consciousness that they will not face, and cannot face its bitterness. In youth it is the disappointed affections, and the bitter tragedies of personal friendships. As

men grow older, it is their failures in the economic side of life, it is their inability to get along and succeed, or disappointed ambitions which crowd to the fore. Of course all through life it is the maladjustment of hidden harm and hidden distortions which have to be sought for, and have to be worked out, but it is invariably a psychologic readjustment that has to be made. The more positive and conceited that a patient shows himself, the more surely may one be convinced that one is dealing with a defence reaction, that is hiding the real reason, which the patient is unwilling to bring out, and face.

Most of humanity are concrete thinkers, unable to abstract their thoughts, unable to appreciate that it is the emotional impulse in life which is the mainspring prompting their actions, whether it be to drink, or to perform any other act, and that they can be just as willful and just as strong willed to get and take their narcotic, as to do any other act in life. This they do not wish to realize, but think that there must be some excuse, some reason which will relieve them of the responsibility of their acts. They therefore turn towards concrete ideas, and believe that there must be some drug, there must be some method of treatment, there must be some substance, that if handed to them, will prevent their drinking. Their relatives and friends beg you to give them something secret in their tea, that unknown to the patient will prevent his going out, and raising a glass of whiskey to his lips. They look for a concrete medicine that will act as a chaperone physically to stop them from doing a specific act.

All alcoholics are the most suggestible of human beings, and very often an impression can be best made upon them enabling them to regain their self-confidence, and to regain their willingness to try for a reconstruction, by giving them some definite routine concrete line of treatment that appeals to this universal suggestibility. On this basis have grown up a large number of definite concrete so-called "cures." They are useful through this appeal to suggestibility, but used alone, they fail. Often they are of

great use if combined with a psychologic rearrangement of the patient.

It is not necessary at this time to go into all the innumerable psychologic details of each type of personality, and its varying conflicts. To treat these patients successfully requires unending patience, and a cheerful charity regarding human frailties.

There is one peculiarity possessed by these patients that should never be forgotten; they never try to do any better than they think that the physician who is caring for them expects them to do, they are always looking for an excuse not to try. It is in these patients that the human mind best shows its unlimited power of self deception.

Considering next the morphine addicts, it is in this form of drug addiction in which the idea that there is a definite addiction disease has taken the firmest hold. This is based on the theory that an infectious disease produces a definite immunity against continued minute doses, or that one attack protects against another, and that it must develop some antibody in the human organism. It has been held that the morphine taken produces some resisting antibody, and that there is a definite distinct entity of so-called addiction disease following its use. This could never be proven, but it made a very attractive theory, and a very attractive picture to justify the taking of the drug.

Recently the work of Light and Torrence in Philadelphia has finally answered the question of the existence of such a disease. These investigators have carefully tested out in completely controlled conditions the physiological processes of the human body in addicts, and have compared them with the normal averages of the non addicted. They have found that persons addicted to morphine do not differ in their physiological processes from average normal non addicted persons. The result of their researches has resulted in a negation, no evidence of an addiction disease can be found. This work is of the greatest value, as it places on a scientific basis the fact that

the taking of morphine does not produce physical disease, nor does it produce morbid processes which show that the normal functions of the body are distorted by the morphine beyond what may occur in normal non addicted people.

At the same time there were in these same addicts no physical neurological changes found. This forces the whole question into the realm of changes of personality, which places these classes of patients definitely in the psychiatric side of medicine. We are accustomed to the average person which we designate as normal, but this normal is not a thin line, but should be considered on a broad plain as human normal beings vary widely, but are still normal. We recognize that individuals differ in their intelligence, and in the brilliancy and dullness thereof. We recognize that individuals vary in their emotional susceptibility, and in the intensity in which they react through these various emotions. We realize that men differ enormously in the intellectual control of their emotions, and in the intellectual control of their actions building up thus the picture of character.

The various distortions of the human mind are recognized under the broad category of the various forms of insanity, but between the normal of the average individual, and the distinct insanity as recognized medically and legally, there are many inadequate psychopathic personalities, not so much inadequate in the stupidity of their intelligence, as inadequate in their balance between intelligence and control of their actions in life, the intellect, however clever, does not control their actions; their actions appear as illogical sequences to their intelligence. They are not legally insane, but they show many of the same mental anomalies as the insane, differing only in degree. It is this class of humanity that cannot bear the stress of life, they have not the resistance to go on against the wear and tear of life, they have not the ability to conform to the usual conventions of society, and because public opinion criticizes, and resents their actions, they in return develop antisocial resentful ideas. It is among this type of men-

tality that so many of the morphine addicts develop; morphine blunts the sense of responsibility, it blunts the necessity of conforming to anything except a self willed selfish contentment.

In the recent work of the Mayor's Committee on Narcotic Addiction of New York City, 87 per cent of the 318 addicts were of this inadequate personality type, and 42 per cent were of the mental type that tend toward an early dementia precox; there were few that tended toward the manic depressive group. As is well known, this dementia group show the hypersensitive shut in type of individuals that are exceedingly self centered, and are easily hurt, and are resentful, but cannot arrange their personalities to harmonize with their environment. The manic depressive group, on the other hand, are more in touch with their existence, but they are unbalanced, varying between an excessive elation, and an excessive depression.

It was noticeable that only about 13 per cent of the group of addicts studied under this committee really conformed to average stabilized personalities. It is thus very evident that this psychopathic class of addict is vastly different from the persons of average stabilized personalities, who become injured or afflicted with painful diseases, and acquire the habit of morphine taking in an endeavor to be free from physical pain. It is worthy of repeated emphasis to state that this latter class are usually classed with the psychopaths, and condemned by public opinion equally with those who take morphine to balance their personalities. But if once rid of their morphine, as we have said before, in the majority of instances this average stable personality when once off the drug will not return to it.

It has been simply the fear of the suffering, and the inability to be rid of their morphine without intense physical distress that has made them go on, hating it, and hating the odium connected with it.

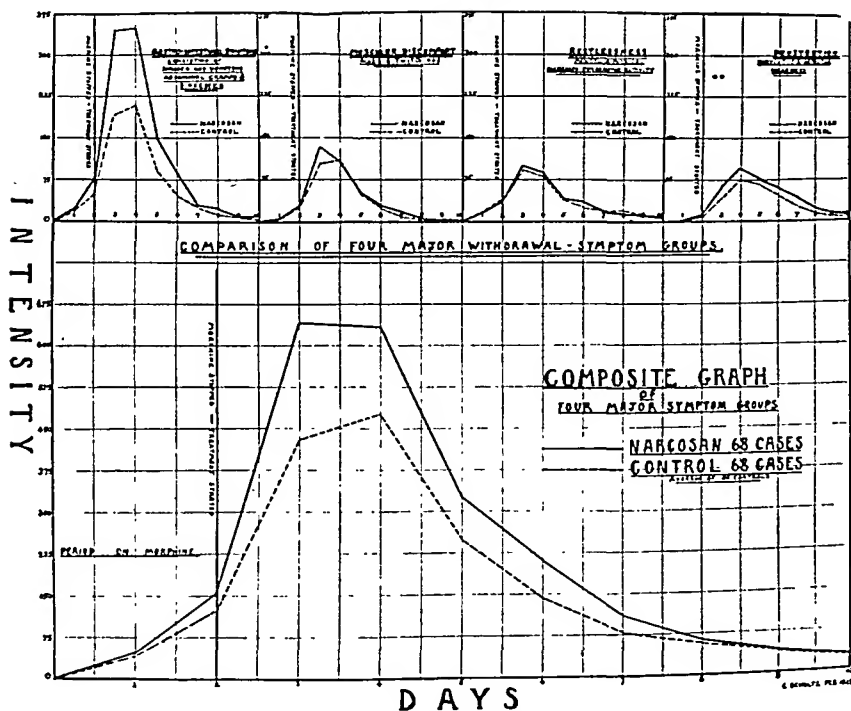
The work of Torrence and Light in Philadelphia under the New York Committee for the Study of Drug Addic-

tion had cleared up so completely the physical reactions of morphine in the body, that the Mayor's Committee on Narcotic Addiction concluded that it was their duty to study the various drugs that were used in the treatment of drug addiction. For that reason, the work that had been done in the Penitentiary on Welfare Island was continued, using a substance that was at that time believed to be of great value in the treatment of morphinism, that is Narcosan, and Narcosan was further studied under the strictest controlled conditions.

Hyoscine and atropin were also tested in a similar manner, and then the reduction treatment of morphine was taken up, in which no drug treatment was used, but the morphine gradually, but surely reduced. A short experimentation followed with the use of codein to relieve the symptoms of withdrawal of morphine. All these separate tests required time in a small ward, with but few patients at any one time. But with the strict control accurate estimates were obtained. The lantern slides here exhibited will show you the curve of each drug compared with an equal number of controls during the withdrawal period of morphine. The controls received no narcotic, unless their condition became such that they were in danger of severe collapse. They were given hypodermics containing Bismarck brown and glycerine in sterile water, and were given it as regularly as the patients receiving the various medications. The symptoms were divided in four classes; first the gastro-intestinal group, with nausea, vomiting, abdominal cramps and diarrhea; the muscular discomfort with aches and twitching was the second group; the third group was the restlessness, mental and physical, and increased psychomotor activity; the fourth group of symptoms were prostration, subjective and objective weakness.

There were 100 patients used for controls; the record of their symptoms gives us a curve which can be used as a standard, and any treatment used during the withdrawal of morphine can be compared in future with this curve to judge the efficacy of its action.

The accuracy of the observations was carefully checked up by one man judging the symptoms, and another man deciding on which patient should be a control, or obtain the treatment under observation, and the nurses in charge not knowing what was being given, or to which patient the control medication, or the actual medication was being administered.

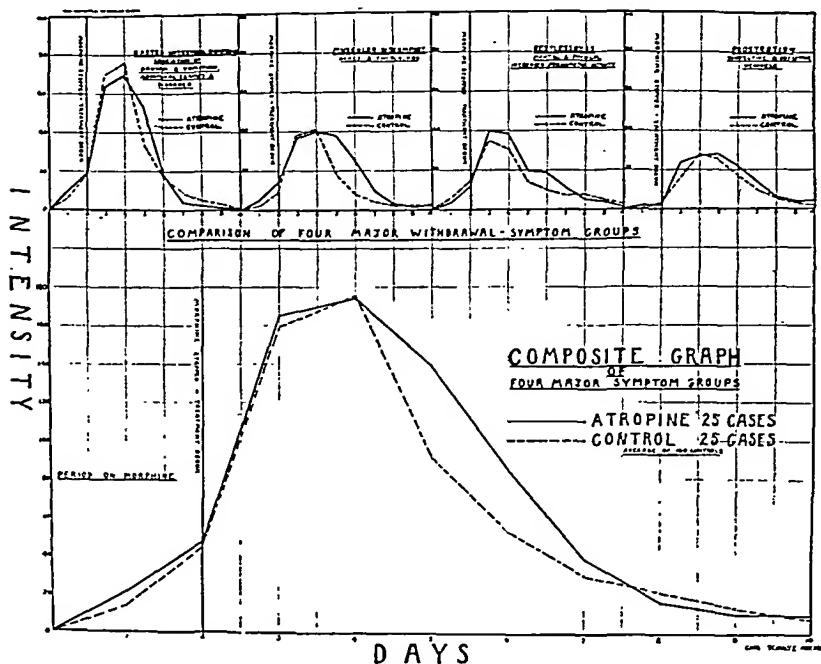


From the report of the Mayor's Committee on Drug Addiction
New York City, 1929

Beginning with Narcosan as a treatment, the results show that the gastro-intestinal symptoms under Narcosan are much increased over the controls; muscular discomfort and aches and twitching come earlier in the Narcosan, rise higher, and then diminish equally with those of the controls; the restlessness is practically the same in Narcosan as in the controls, the prostration is during the entire treatment, slightly more noticeable under Narcosan than in the controls. In the previous experimentation with Narcosan it had been believed that controls were not necessary, as

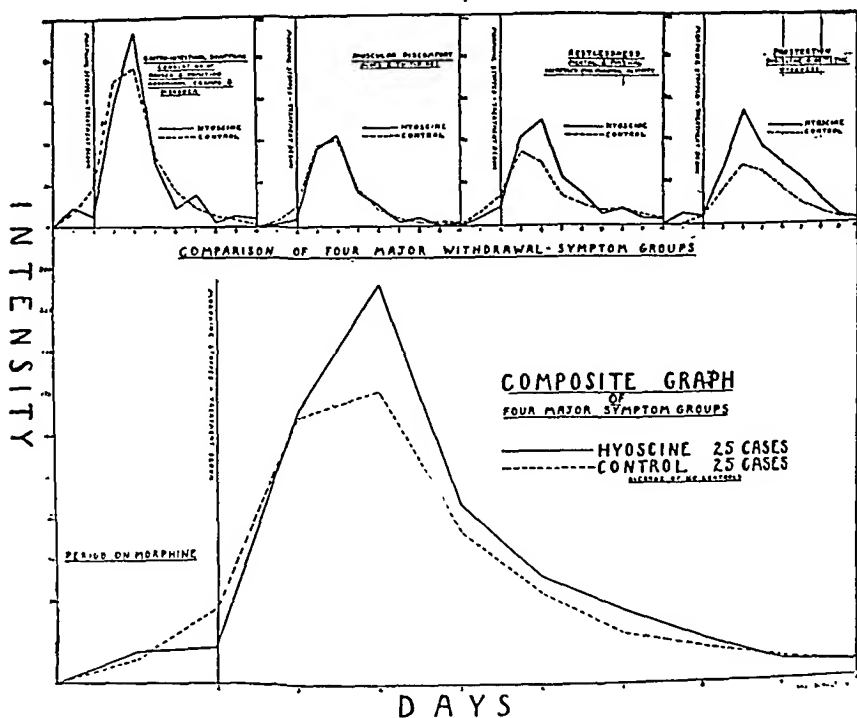
we were familiar with the reduction symptoms of morphine. This proved to be an error of judgment, as it was not realized at that time how self limited the withdrawal symptoms of morphine are. It is evident that in the controls receiving no morphine the symptoms are limited to 72 or 96 hours, and while also it is evident that patients through the intensity of their fear, or through the intensity of the collapse produced by the withdrawal of morphine, may die from sheer nervous collapse and exhaustion, that if morphine is given to prevent this collapse, the patient suffers for 72 or 96 hours, and then there is a rapid reduction of the symptoms.

The insomnia is a very trying symptom after the withdrawal of morphine or the opium narcotics. Whether or not it returns quicker after other drugs have been used than in the controls, has not been recorded, and it is not possible to say.



From the report of the Mayor's Committee on Drug Addiction
New York City, 1929

The next drug to be tried as a treatment was the atropin treatment. It is evident from the curves that those receiving atropin show about the same intensity of symptoms as the controls, but that the recovery from their symptoms is prolonged, and they recovered more slowly from their symptoms under atropin than the controls. The gastro-intestinal reaction is less severe under atropin, their muscular discomfort is not quite as severe, but remains distinctly longer, their restlessness however, is more intense under atropin than in the controls, and their prostration occurs quicker, and is more prolonged, and is slightly more intense.

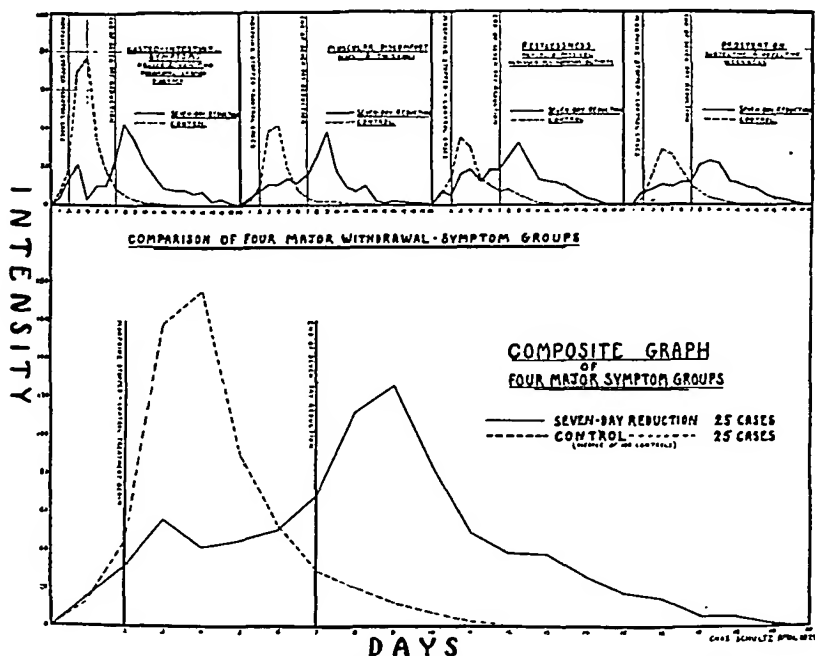


From the report of the Mayor's Committee on Drug Addiction
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Under hyoscine it is evident that patients suffer more than the controls; their suffering does not begin as soon, it rises to its climax at the end of 48 hours of treatment, and the gastro-intestinal symptoms are markedly increased

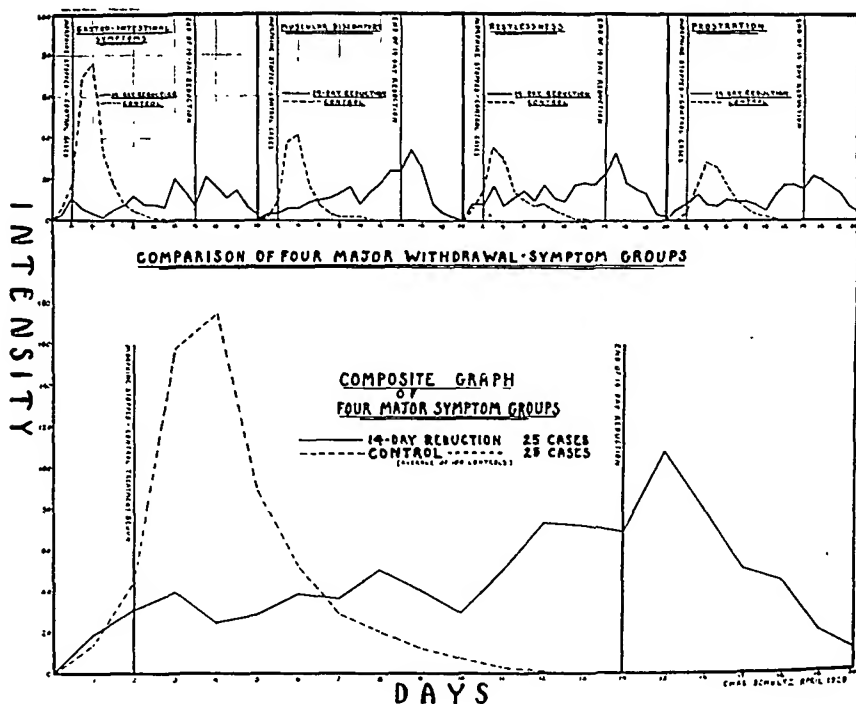
under the hyoscine. Their muscular discomfort is practically the same as in the controls, and their restlessness and delirium and mental and physical activity are enormously increased under hyoscine, as well as is their prostration, which is more intense in all periods of the treatment, beginning earlier, and lasting markedly longer.

These findings here agree with our previous clinical experience, that patients being taken off under the hyoscine treatment suffer for days, or weeks, from a bodily and mental exhaustion, which is one of the most marked features of the treatment.



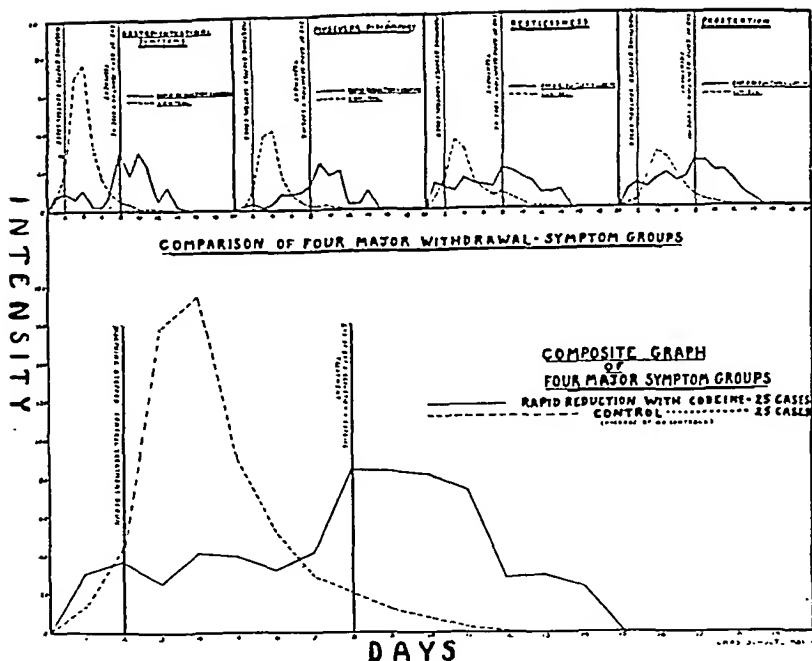
A seven day reduction of morphine patients was tried, in which compared with the controls, the patients suffered materially less, but it was simply a prolongation of their suffering; at the end of a week they were cut off their drug, the withdrawal symptoms came on, but in all with very marked diminution in intensity; the patients, however,

were less easy to care for, they were irritable, mean, more quarrelsome, and more difficult in every way to manage. It is interesting, that after the morphine was cut off from these patients, as the curve shows, they still had about 72 hours of increase of symptoms.



From the report of the Mayor's Committee on Drug Addiction
 New York City, 1929

With a 14 day reduction, it is noticeable that the gastro-intestinal symptoms are reduced to a minimum, and their muscular discomfort however, increased, with a rising curve towards the day that their morphine ceased to be given to them at the end of 2 weeks, and then flared up for 48 hours, and rapidly diminished; their restlessness was diminished over the controls, but in a rising curve, until it also disappeared, and their prostration shows a similar curve, but to a less degree.



From the report of the Mayor's Committee on Drug Addiction
 New York City, 1929

The next method of treatment was an endeavor to ascertain to what extent codein would control the withdrawal symptoms of morphine. Our clinical experience had taught us that codein does control it, and that codein is so rapidly discharged from the body by the kidneys, that it is not stored up as long as morphine, nor does it possess the narcotic value to the human organism that morphine does. It produces sleep, it alleviates pain to a marked degree, but that curious narcotic value it does not possess, and codein habits are exceedingly rare. In 1700 patients in private practice, all of whom were treated for many different kinds of narcotic addictions and combinations, between the various habit forming drugs of the opium group, or the hypnotic chemical group, it was found that only 10 of them were addicted to codein, and these had acquired it through their endeavor to alleviate pain.

In those taking rapid reduction with codein, the curves show that at the end of the week when the morphine was cut off, there were the regular three days of increase of symptoms after the codein was also cut off, but these symptoms do not rise as high as with the 7 day reduction, nor as high even as the symptoms after a 14 day reduction.

In other words, after the codein has been cut off abruptly the symptoms of the deprivation of the narcotic are not nearly as intense, although the curve is a much broader and blunter one, it suddenly ceases at the end of three days.

Since carrying out these experiments at Bellevue Hospital, it has been found in private practice that if the codein is continued a few days beyond the morphine, and is tapered off rather rapidly, that is taking four or five days to taper the codein off, the symptoms are reduced to a minimum, although there is a sense of irritability and restlessness, but even that is nothing compared with the usual withdrawal symptoms. In other words, the withdrawal symptoms do not go beyond the intensity of the disagreeable restlessness, produced by the cutting off of any narcotic. The gastro-intestinal symptoms disappear, the muscular discomfort is at a minimum, the restlessness is the most marked of the symptoms, but that soon ceases. It is evident therefore, that codein is the only drug that really modifies materially and successfully the withdrawal symptoms of morphine.

The best method of giving this treatment is to calculate the amount of morphine in terms of magendie solution, that a patient is taking in 24 hours; then for a 10 day reduction, diminish the morphine each day about $1/10$ th. As the morphine is best given at 4 hour intervals, the amount is again divided by 6 as there are 6 doses a day, and the amount of reduction is easily calculated in the number of minims of magendie solution. For instance, if the patient is taking the equivalent to 120 minims a day of magendie solution, he is taking 20 minims every 4 hours; if he is to be reduced 12 minims a day, he is reduced each day at

each 4 hour dose 2 minims of his magendie solution; in this way in the 10 days his magendie solution is brought down to zero. But at the same time that his morphine is reduced, the codein rises from the second day beginning at $\frac{1}{2}$ grain every 4 hours the first day; then a grain every 4 hours the second day; then three grains every 4 hours the third day; four grains every 4 hours the fourth day, and five grains every 4 hours the fifth day, and it is given in solution with the magendie solution. It is wise to use the codein phosphate because of its greater solubility, and if the codein solution is made up in the same form as the magendie solution, it is easily accessible, the desired amounts can be given every 4 hours in the same syringe as the magendie solution, and in this way, the patient does not know when the morphine ceases to be given to him. If this amount of codein is not sufficient, extra doses of codein can be given without harm to the patient, or to his reduction treatment. This large amount of codein is apt to be very constipating, and the patient should receive the amount of cathartics that is necessary to keep the bowels in good action; severe purging is not necessary under this form of treatment, and it is apt to irritate the gastro-intestinal tract. Of course the intestinal tract should be thoroughly cleared out before beginning the treatment; it is also wise to test out the patient for the first 24 or 48 hours of treatment with the amount of morphine that the patient tells you he is taking, to see whether or not he is comfortable. Morphine patients always have the defence reaction, and the fear of being condemned for the amount they take, and are often inaccurate in their statements regarding the amount taken.

The advantage of this codein and morphine treatment is that they suffer so little, there is no occasion for deception, there is no question of a defence reaction for fear of suffering, they get off their treatment without the irritability and fear of suffering that the abrupt methods, and old methods of treatment gave them, so they are very manageable.

Of course if you are dealing with patients that don't want to recover that don't want to be taken off, if you are dealing with a large mass of psychopathic addicts with inadequate personalities, who make no attempt at reconstruction, you will deal with every sort of deception and every known form of resistance, and lack of coöperation. But in private practice with those who have been caught in the toils of the narcotic habit through legitimate medication, or through the existence of pain, this treatment is very easily administered in a hospital, and they can easily be taken off their narcotic.

All morphine patients after they are once off should be reconstructed physically as well as psychologically, and the best method of this is through physical exertion, exercise or work, and after they have become built up into good physical condition, the sooner they get to work and occupation with the re-arrangement of their psychologic distortions, the better and the quicker will they be able to face existence cheerfully without their drug.

Sleep comes to them gradually during their period of treatment, and in the restless period of the few days as their morphine is cut off, or their codein diminished, hypnotics are very difficult to administer. Sodium Amytal and practically all members of the barbituric acid group, if given, in sufficient amounts really to make patients sleep, and influence at all the withdrawal symptoms, must be given in amounts that poison them, and in the endeavor to obtain sleep for these patients, the poisoning from the various hypnotics given, up even to the point of delirium from them, has been a noticeable feature. It is harmful in my opinion, to push hypnotics as far as this, it only adds to the poisoning of the patient, and does not relieve the withdrawal symptoms, but adds to the difficulties of the situation.

Chloral with codein and a little hyoscyamus is again a very useful hypnotic for these patients, but even this cannot be continued too long. Patients must be made to fight out their lack of sleep by endeavoring to read, or by

taking hot baths, or hot packs, which relaxes them. They gradually obtain sleep more and more each night, and if they can be made to take physical exercise followed by tonic baths in the day time, they can, through this physical exertion, obtain their sleep quicker than otherwise. The question is often asked, what can be done for the inadequate group of personalities that form the ever recurrent narcotic addicts in the penal institutions. It is only through forced confinement, and learning some trade, and working at some definite work, that these patients can be trained and reconstructed. Occupational therapy in forced confinement is the best solution. This will slowly regenerate a larger number than can otherwise be done. If at the same time an endeavor is made to take these patients individually to reconstruct their distorted mentalities and distorted views of life, a great deal can be done to diminish their number, but this is a problem which should be undertaken by the State, just the same as the State to-day undertakes the care of the insane. These individuals should be regenerated, and treated like those who are unable to lead a more normal existence, and should be treated, not as if in a boarding house for permanent care, but should be taken and treated like those who are mentally ill, and through persistent treatment can be reconstructed.

It is at present hopeless to take care of certain individuals of both drug addicts and alcoholics without the power to deprive them temporarily of their liberty, and force them through institutional care and reconstruction to reorganize their lives and their mentalities. This at present, the law does not permit, but until it is done, many inadequate personalities will continue to seek their peace of mind in narcotic addiction.

BOOK REVIEWS

Greek Pediatrics. Sophokles Ghinopoulo; Pädiatrie in Hellas und Rom. Jenaer med.-hist. Beitr., Heft 13. 132 pp. 8° Jena, Gustav Fischer, 1930.

F. H. GARRISON

The merits of this monograph are that it is the work of a physician to whom spoken or written Greek is a native language, that it covers the extant pediatric material of classical antiquity, and that this material is not dispersed under a chronologic succession of authors, as usual, but systematically arranged under the rubrics ordinarily employed in a text-book of pediatrics. For the first time, in fact, we have a reasoned conspectus of the total pediatric canon of antiquity, always keeping in mind the important point, stressed by Oliver, that the formal, didactic, baseline medicine of classic texts was something quite different from the actualities of practice in any particular period. With this latter phase, the introductory section deals to some extent, albeit with no such lift of broad humanism as informs every page of Sister Mary Rosaria's memorable dissertation on *The Nurse in Greek Life* (1917). Among the new features are four votive inscriptions from Epidaurus relating to children as patients at the shrine; Favorinus as an apostle of maternal breast nursing, (Aulus Gellius); the *Columna lactaria*, in the *Forum olitorium*, as a bureau of wet-nurses for the poor of Augustan Rome; the dry nurses (*assae nutrices*) of the period, who went in for bottle-feeding; and the lost pediatric text of Demosthenes Philaethes. A rapid survey of the pediatric content of the older writings, with notes on the infantile diseases most prevalent in antiquity, closes this introduction. The next section (Chapter I) deals with Galen's views on the constitution of the child (a phase of humoral physiology); Hippocrates on the viability of the seven and eight-months child, a theme of solemn, serious import among the ancients which has evaporated considerably under the broad humorous light of German folklore (*Siebenmonatskind*); and the opinions of the old

writers on infantile abnormalities and deformations, swaddling and general management of the new-born. Chapter II is taken up with an exhaustive survey of infant-nutrition and wet-nursing as expounded by Soranus, Pliny, Celsus and Oribasius. Chapter III, on digestive disorders, gives, among other things, 13 aphorisms from the pseudo-Hippocratic tract on teething, with the views of subsequent writers; Hippocrates, Galen, Aetius and Alexander of Tralles on intestinal worms, and the various remedies employed by the ancients for tape-worm, cholera infantum, infantile diarrhœa and constipation. The same general plan of selection and arrangement of telling material characterizes the subsequent chapters on diathetic and communicable diseases, affections of the respiratory, circulatory, urinary and nervous systems, diseases of the skin, ears and eyes, and infantile surgery. For ready reference, therefore, this pamphlet is the most practical and useful compend of the subject which has yet appeared. What seems dry in the handling becomes of little moment if the material is wanted for research purposes.

THE MODERN DANCE OF DEATH

The Modern Dance of Death. By Peyton Rous. The Linacre Lecture, 1929. 51 pp. 16°. Cambridge, University Press, 1929.

Written in flawless English of archaic sobriety, this thoughtful contribution of Dr. Rous is packed with meaning and not to be overlooked by those who would know the last word of experimental medicine on human and animal reactions to disease and their fatal terminations. Each sentence states a thought or an ascertained fact, and huge segments of recent investigation are summarized with almost algebraic brevity. It is a charming lay-sermon upon the multifarious albums of Holbein type, of which Dr. Warthin has made such an extraordinary collection. The more recent Dances of Death, Dr. Rous notes, particularly those of the post-bellum period, are grim, grisly, *gesucht traurig*, if you will, but nothing like as bitter, hopeless or

fatalistic as Holbein's original conception. Even the *Totentanz* which forms the terminal movement of Brahms' E-minor Symphony (*Thanatos Basileus*) is jocund, virile, exultant, exhilarating. The tremendous upward inflection of the initial eight measures of the *passacaglia* suggests Swinburne's dictum: "Nothing that produces a depressing effect is a true work of art." The *défi* at the end is the *défi* of Beethoven's last quartet (*Muss es sein? Es muss sein!*). To contrast with these moods the ineffable sadness of the *Dies irae* or the *Kyrie* in Bach's B Minor Mass is to realize our author's thesis that, however much they may lament the loss of their loved ones, real people of to-day no longer view their own end with apprehension or anticipatory horror. Something, no doubt, was learned from soldiers marching to their certain doom to the tune of Tipperary. Andreyeff's *Lazarus*; Tolstoi's *Ivan Ilyich*, Rachmaninoff's *Toteninsel* are archaisms. Shelley, Turgenieff, Baudelaire, Wagner, Browning, Bryant, Emerson, Whitman view death with equanimity. W. W. Keen even writes of "the cheerfulness of death," as the logical and physiological term and end of our sublunary existence. And the reason is not far to seek. "We live more than twice as long as did persons in Linacre's time, when to be an old man was well-nigh a profession in itself." We no longer die the deaths of others in thought, because we are too busily absorbed in our own extended span of existence, the length of days lost to our ancestors. Only the aged are concerned with prolonging life, as only the impotent and sterile are concerned about rejuvenation. We begin our Dance with Death before birth and it persists "from the womb to the tomb." Life is become less a battle and more like Mignon's blindfold dance among the eggs. As Sudhoff pointed out in his Johns Hopkins address, many diseases, which mowed down our ancestors like the scythe of the Grim Reaper, have now acquired an historical status as museum specimens. To indicate some limitations of this historic process is one object of Dr. Rous's lecture.

To begin with, there is no change in the ultimate pathology of mild or aborted diseases, and the sequelae of disease

to-day are oftentimes those to which the shorter-lived people of the past were not exposed. "Abortive attacks differ from typical ones mainly in the extent and severity of the lesions, not in their intrinsic character." Hyperimmunizations and anaphylaxis become negligible as sera are purified, but allergy is now known to play a large rôle in the ordinary manifestations of tuberculosis, syphilis and actinomycosis. Neoplasms yield to irradiation but cancer is still an indecipherable interaction between the body and rebellious growing tissue. The sequelae, if any, in anæmics healed by liver extract and diabetics preserved by insulin, are yet to materialize. "Insulin death as new pathology is very real." Beyond the fact that there is more of it and that more successful, surgery, so far, has only italicized what ordinary pathologic processes made plain, e.g., that myxœdema and tetany are due to thyroid and parathyroid insufficiency respectively. Chopping out tonsils, gall-bladders, ovaries, uteri as "prophylaxis" are fashions that spend themselves. Artificial lungs, livers and kidneys that will work inside the body are yet to be invented. Transplants atrophy and fail because the organs and their prospective hosts are found to have biological individualities, all their own, like human beings or the red cells of that "*ganz besonderer Saft*," their blood. Transplanted tumor cells survive "by aggression" only. Transplants, even within the species, are passive agents at the mercy of their bodily hosts, and cells of residual fragments of highly specialized organs will not ordinarily proliferate to reproduce the total structural arrangement, as with bone grafts. With the exception of the fragmentary liver, in which "reconstitution is functionally perfect," halved kidneys or lungs merely grow bigger, and even the new liver is a fragile mycelium, becoming like a blood clot in the end. Tissue regeneration, as in the thyroxinized cretin, is conditioned by "dormant potentialities," the nature of which we do not know. The liver, the suprarenals, the small intestines exist in proportions far in excess of functional needs, yet the 1/20 of adrenal cortex necessary to sustain life will atrophy through its incapacity to pro-

liferate. Physiological surgery has thus become a functional tester of prime importance in the matter of delimiting the biological potentialities of organs and tissues. Under the altered physiology producible by surgery, the organism merely reverts to well-worn pathways and never strikes into new ones. But this fact was already known to those initial exponents of "altered physiology," the pathologists. "For morbid anatomy is merely the footprint left by physiology." Every accessible organ has been tampered with, surgically and otherwise, from the days when prehistoric man punished the involuntary muscle of his intestines with indigestible foods, but nothing particularly new has transpired. In the witticism of O. W. Holmes, a guileless young thing will eat the proffered Hot-Cross Bun; an experienced, hard-boiled oldster will reject it. Acquired immunity is seen to be an expansile adaptation of the system to "menaces which increase by geometrical progression as the harmful micro-organisms divide." This is the only difficult adaptation to which the human frame has been subjected throughout historic time. By comparison, adaptations to heat, cold, atmospheric pressure, aeroplane and caisson life are so facile as to be negligible. Such potentialities of the organism as increase in size (of body and organs) *viâ* endocrine injections are perceived at once to be worse than worthless. Man's conquest of the communicable infections has been abrupt and comprehensive. The persistence of these diseases through his past was obviously due to his own inability to think. Gout and all the diseases due to overeating disappeared in famine-ridden areas during the World War and diabetes is seen to be a penalty of obesity. Most diseases, then, are adventitious as far as mere mind is concerned and should be quite within the control of advancing human reason. In other words, they are preventable in theory, but actually "occupational," with reference to a peculiar constitution occupied with functioning along predestined lines. Here, mind and body are seldom at one. Humanity at large, says Rous, is not isocephalic. Minds of mystic type will continue to be romantic and morbid, where rational-

ists conceive most diseases to be avoidable. The most fatal diseases to-day are no longer tubercle, syphilis, diphtheria, typhoid and infantile diarrhœa but heart disease, nephritis, apoplexy, cancer and pneumonia. When these shall have been conquered, the New Dance of Death will be that of the senile organism with diseases incident to a newer longevity, diseases which "had few targets in the past." When that millennium is reached, "the loud hymns of the physiologist in praise of the body will have died away." The search for an elixir of life will be as rabid as formerly, but Dr. Rous concludes that youth will be less inclined to "live dangerously" as to physical or moral health and the mind will eventually acquire its place in the sun. "The new science of living long and well will bring with it a science of dying, to supplement that most difficult of arts."

F. H. GARRISON.

THIRD ANNUAL GRADUATE FORTNIGHT OF
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Evening meetings at the Academy. The evening meetings will begin promptly at 8:30. No tickets of admission will be required.

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NOVEMBER 7

Epilepsy and the convulsive state.

Foster Kennedy, Professor of Neurology, Cornell University Medical College.

"Epilepsy" in need of definition. Considerations regarding its mechanism. The vascular basis of convulsions. Theories regarding causation. Varieties of epileptic explosion. Prognosis. Treatment.

NOVEMBER 14

Carcinoma of the colon.

Frank H. Lahey, Surgeon-in-Chief to the Baptist Hospital, Surgeon to the New England Deaconess Hospital, and Director of Surgery at the Lahey Clinic, Boston.

Its earliest symptoms, its incidence in the cecum, transverse colon and descending colon, and the relation of its symptoms to its location. The effect of intestinal obstruction and its mortality, and also measures to overcome intestinal obstruction as well as operative procedures for its safe removal.

NOVEMBER 21

The treatment of pelvic infections.

George Gray Ward, Professor of Obstetrics and Gynecology, Cornell University Medical College, Chief Surgeon, Woman's Hospital.

Pelvic infection in women, the result of septic, Neisserian or tuberculous organisms is responsible for woes and sorrows of a large proportion of gynecological patients.

Acute pelvic inflammatory lesions are generally better treated expectantly than radically; surgery only indicated in curing the sequelae of the disease and not the infection itself. Parametritis and perimetritis.

The indiscriminate use of the curet as an etiological factor. Treatment. Results at the Woman's Hospital.

DECEMBER 5

The thyroid.

Nellis B. Foster, Associate Professor of Medicine, Cornell University Medical College.

Its range of physiological control and the clinical syndromes resulting from abnormality in this control.

DECEMBER 12

The therapeutics of ultra-violet light.

Alfred F. Hess, New York.

What is known in regard to the value of ultra-violet irradiation in the prevention and cure of various disorders of adults as well as children. Attempt to fix limitations of its indications. The method of its employment and possible harmful effects.

DECEMBER 19

Occupational and industrial diseases.

Miss Frances Perkins, State Industrial Commissioner, Albany.

1931

JANUARY 9

Treatment of anemia.

George R. Minot, Professor of Medicine, Harvard University; Director of Thorndike Memorial Laboratory and Associated Medical Services, Boston City Hospital.

Advances in the treatment of pernicious anemia. The importance of abnormal diets and alteration of gastro-intestinal functions in the production of simple anemia. The value of iron and food in the treatment of certain types of anemia. Consideration of other therapeutic procedures.

JANUARY 16

Diet in Disease.

Eugene F. Du Bois, Professor of Medicine, Cornell University Medical College, Director Second Medical Division, Bellevue Hospital.

General principles concerned in planning diets of adults in the clinic, total calories, proteins, fats, carbohydrates, vitamins, salts and roughage.

JANUARY 23

Roentgenographic delineation of the urogenital tract.

Joseph F. McCarthy, Director, Department of Urology, New York Post-Graduate Medical School and Hospital.

Newer technical methods will be demonstrated. The role of intravenous pyelography in its relation to instrumental procedure, and in turn, to the general practitioner, will also be considered.

JANUARY 30

Certain aspects of syphilitic cardiac disease.

Edward P. Carter, Resident Lecturer in Medicine, Johns Hopkins University; Associate Physician Johns Hopkins Hospital, Baltimore.

The clinical diagnosis, prognosis and treatment with especial emphasis upon the significant clinical features of the condition.

FEBRUARY 6

Osteomyelitis.

Dean Lewis, Professor of Surgery, Johns Hopkins University, Baltimore.

FEBRUARY 13

Tuberculosis of bones and joints—diagnosis and treatment.

William S. Baer, Clinical Professor of Orthopedic Surgery, Johns Hopkins University, Baltimore.

FEBRUARY 20

Cancer as a complication of skin diseases.

Joseph J. Eller, Assistant Professor of Dermatology, New York Post Graduate Medical School and Hospital.

Based on clinical, microscopic and therapeutic studies of over twenty different skin diseases which are forerunners of cancer. The possibility and probability as well as the frequency with which cancer follows these conditions will be considered separately and in their approximate order of importance. The early recognition by the general practitioner and the judicious treatment of those dermatoses which may lead to cancer would aid in lowering the mortality rate in this disease.

FEBRUARY 27

More common diseases of the teeth and jaws.

Theodor Blum, Oral Surgeon, Department of Dentistry, Sydenham Hospital.

Oral focal infection, teeth root amputations, impacted teeth, tumors, facial pains and trifacial neuralgia.

Vincent's infection.

Raymonde A. Albray, D.D.S., Consulting Oral Surgeon, Hospital of St. Barnabas, Newark.

Symptoms of acute Vincent's infection; importance of early diagnosis; chronic Vincent's infection; communicability; bacteriology; treatment of acute and chronic types; tests to determine effect of treatment; various remedies discussed.

MARCH 6

Practical advances in the study of the liver and its diseases.

Reuben Ottenberg, Associate Physician to the Mount Sinai Hospital.

In the last ten years there has been great advance in the knowledge of liver functions. This will be reviewed and its clinical applications pointed out.

MARCH 13

Silicosis; its present aspect.

Henry K. Pancoast, Professor of Roentgenology, University of Pennsylvania Medical School; Roentgenologist to Hospital of the University of Pennsylvania.

The hazards attending the inhalation of large quantities of dust containing a high percentage of silica are worthy of serious attention, especially with a view of attempting to reduce them. The pathology of the condition and its roentgenologic aspects.

MARCH 20

Arthritis.

Ralph Pemberton, Physician to The Presbyterian Hospital, Philadelphia; Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania.

Importance of the problem. Recent developments bearing on it. Types of the disease. Outline of pathological background from which the disease springs. The immediately exciting factors. The contributory factors. Importance of considering the many influences operative. Importance of restoring deranged physiology as well as re-

moving the initial cause. Encouraging results following broad-gauge treatment. Extent of existing invalidism from arthritis not justified. Prevention.

MARCH 27

Allergy in children.

Bret Ratner, Clinical Professor of Pediatrics and Lecturer in Immunology, New York University and Bellevue Hospital Medical College.

Diagnosis and management of asthma, eczema and urticaria in infancy and childhood. Its etiology indicating that these syndromes are acquired in utero and in early infancy. History taking, protein skin tests, blood chemistry, cytology. Plan for study and of preventive measures.

APRIL 10

The early diagnosis and treatment of poliomyelitis.

Josephine B. Neal, Clinical Professor of Neurology, Columbia University.

The clinical picture of early stages of poliomyelitis. Differential diagnosis. The value of spinal fluid examination. A discussion of treatment.

APRIL 17

Problems of gastro-enterology today.

Walter C. Alvarez, Associate Professor of Medicine, University of Minnesota, The Mayo Foundation.

In about two-thirds of the patients seen with gastro-intestinal complaints an exact diagnosis cannot be made. These cases now challenge the ability of every thoughtful gastro-enterologist. In many instances the troubles complained of are nervous in origin but in others organic disease must be present. It is in this group that we must gradually pick out and identify new syndromes.

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DEATHS OF FELLOWS OF THE ACADEMY

ARCHIBALD M. CAMPBELL, M.D., 36 South First Avenue, Mount Vernon, N. Y.; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1873; elected a Fellow of the Academy January 2, 1890; died, August 31, 1930. Dr. Campbell was a member of the American Medical Association, Medical Society of the State of New York, Society of Medical Jurisprudence, the Medical Society of Westchester County, Mount Vernon Medical Society and the Jenkins Medical Society in Yonkers. He was at one time President of the Medical Board and consulting physician and surgeon to the Mount Vernon Hospital. He was also consulting physician and surgeon of the Home for Incurables at Fordham, and attending physician at the New York Infant Asylum.

ASA BARNES DAVIS, M.D., 44 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1889; elected a Fellow of the Academy May 6, 1909; died, August 13, 1930. At the time of his death and since 1918 Dr. Davis was Chief Surgeon of the Lying-In Hospital, and had been connected with that Institution continuously since 1890. He was a Fellow of the American Medical Association and of the American College of Surgeons, a member and one time president of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons.

H. BEECKMAN DELATOUR, M.D., 73 Eighth Avenue, Brooklyn; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1887; elected a Fellow of the Academy April 5, 1900; died, August 24, 1930, in Paris. Dr. Delatour was a Fellow of the American College of Surgeons, and member of the American Medical Association, International Surgical Association, American Surgical Association, Brooklyn Surgical Society and the New York Surgical Society. He was Surgeon-in-Chief to St. John's Hospital, Senior Surgeon, Norwegian Deaconess Hospital, and Consulting Surgeon to Methodist Episcopal Hospital, St. Mary Hospital, Jamaica Hospital, Babylon Hospital, Rockaway Beach Hospital and South Side Hospital.

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CAN OUR METHODS OF OBSTETRIC PRACTICE BE IMPROVED?

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When we ask a question such as that which forms the title of this talk: "Can Our Methods of Obstetric Practice be Improved?", the answer must obviously be in the affirmative. In no department of human knowledge or endeavor can we ever reach finality. When we can sit back and self-complacently assume that we have reached perfection it is time for us to make way for others with livelier imaginations, larger vision, and greater energy. So far as the practice of Obstetrics is concerned there has never been even a temptation to assume that the ideal has been attained. It is to their credit that obstetricians have been constantly aware of the shortcomings in the practice of their art for it is only now that the medical profession as a whole is coming to realize that something is wrong and that a remedy is urgently needed! Why is it that in spite of the tremendous advances in the knowledge of disease and in the application of remedies obstetrics stands practically alone in showing no diminution in mortality? One reason is that the practitioner has not received an undergraduate training in obstetrics as complete and as detailed as he has got in general medicine and surgery. Obstetrics has been the Cinderella in the clinical years of the medical

curriculum in medical schools in this country and indeed throughout the world. It is noteworthy that maternal mortality is lowest in those countries in which the medical schools give the longest and most complete undergraduate obstetrical courses. I refer to the Scandinavian countries in particular.

Within the last two years there have been two notable investigations into the teaching of Obstetrics, one by Dr. Palmer Findley in the United States (*Am. Jour. of Obs. and Gyn.*, Nov. 1928) and one by Mr. Comyns Berkeley in Britain (*Jour. of Obs. and Gyn. of the Brit. Empire*, Winter 1929). Each comes to the independent conclusion that a much larger block of time is required for Obstetrics in the medical curriculum and that this should be obtained by taking some of the time at present given in our schools to surgery. In most countries the ratio of time given to surgery as compared with Obstetrics is as 2 to 1, but in the United States the ratio is as $4\frac{1}{2}$ is to 1. Findley quoting from a report of the Committee on Maternal Welfare (1925) states that the services of the general practitioner of medicine in this country are proportioned as follows:

Internal Medicine	50%
Obstetrics	35%
Minor surgery, Fractures, Life Insur-	
ance, etc.	15%

As the function of the medical school in its undergraduate course is to qualify the student for the general practice of medicine there is obviously something radically wrong in its apportionment of time to the different subjects.

It is interesting to go back and trace in the history of Obstetrics and of medical education in general how this disparity has come about. Obstetrics, of course, was badly handicapped from the beginning. Medicine and Surgery had several centuries of a start. No Obstetrical teaching was given in the United States till the middle of the 18th Century and no real clinical instruction until 1874. In England, Smellie began his teaching about 1736 but the

first University Professorship of Midwifery in England was not established until 1886. Scotland was more progressive, for to it and to the University of Edinburgh belong the distinction of having the first Professor of Midwifery. He received his appointment from the Town Council of the City of Edinburgh in 1726. The prejudice against the man midwife in these early days and the impossibility of conducting anything in the nature of an Obstetrical clinic are matters of common knowledge. The Obstetrician was on a social and professional status far below that of the physician or even of the barber surgeon. His views about the teaching of his subject thus received scant attention. But even in these more enlightened days, his has been as a voice "crying in the wilderness." It was not until 1886 that the General Medical Council of Britain insisted on an examination in Midwifery as being necessary for registration as a practitioner of Medicine. Until within recent years hospital facilities for the teaching of Obstetrics have been totally inadequate. Faculties of Medicine have failed to realize the importance of Obstetrics in their curricula and it is only now that the public is awakening to the fact of a stationary or even increasing maternal mortality rate that the practitioners of Medicine and of Surgery, the Faculties of Medicine, are becoming aware of the importance of the subject.

Meantime what have the Professors and Teachers of Obstetrics in our Medical schools been doing? They have been advancing with the advances made in Medicine and Surgery. They have devised and perfected new operative technic in Obstetrics. They have reduced the mortality of the various obstetrical complications in those patients who have come under their own care and the care of those to whom they have given an adequate training. They have been asking that their students be given a longer time to spend in their Departments and in most instances their cry has been in vain with the result that a vast number of medical students have left our schools and gone into practice with the idea that the greater part of Obstetrics is

operative. They have seen operative obstetrical procedures carried out by experts with ease and with safety to the patient, and they have not realized that as much technical training and skill are required for these as for any major surgical procedure. They have attempted to practice these procedures often on fundamentally wrong indications and often with disastrous results to their patients. I do not think it is overstating the case to say that the majority of doctors now practising Obstetrics throughout the country saw during their student course more abnormal than normal cases and that they got no idea of the number of women who gave birth to their children unaided. Fortunately, that state of affairs is being remedied. In our best medical schools, more—although not yet enough—time is being given to Obstetrics so that the student can work in the prenatal clinic and follow through normal cases in the hospital and on the district. I feel that the practice of Obstetrics throughout the country will not materially improve until every practitioner shall have had the opportunity as a student of spending a solid block of time—not less than three months in his final year—in the prenatal clinic, in the wards, in the labor room, and on the district of a properly equipped and managed maternity hospital.

For the betterment of Obstetrical practice throughout the country I, therefore, put in the forefront the necessity for better Obstetrical training for our medical students. I am one of those who deprecate specialization during the undergraduate medical course and who feel that the training there given should be so balanced as to conform to the demands made upon the general practitioner in his early years of practice. Specialization must come later. With the better training of our students I feel sure that there will come a more conservative practice of obstetrics in normal cases and an earlier and more accurate recognition of the abnormal, a clearer realization of the technical difficulties of dealing with some of the latter, and of the need for expert advice and treatment.

But give\ all this, some further development is in my

opinion necessary in this country. So far as I have gone I feel reasonably sure that I have not said anything with which any of you acutely disagree. I am not at all sure that I can carry you all with me in what I think is the logical consequence of what I have said, viz., that the medical profession requires technical assistance in its Obstetrical work throughout the country and that that technical assistance should be supplied by the trained midwife or obstetric nurse—call her what you will. For the development of my argument let me put certain facts before you.

The first fact that we have to face is that maternal mortality in the United States is one of the highest among civilized countries. A glance at Table 1 brings this home to us in striking fashion. Over a four year period, 1920-1924, the total maternal mortality in the United States was 6.7 per 1000 live births. In the Netherlands it was 2.4. Between these two come thirteen countries, all with a better showing than we have. One country alone, Chile, has a higher rate than ours.

In practically all countries the most frequent single cause of death associated with childbirth is puerperal sepsis. Taking this one item alone we see again (Table 1) that the United States occupies an unenviable position, fourth on the list from the top, eleventh on the list from below.

It would be foolish to suppose that any one factor in living conditions or in obstetrical practice in this country is responsible for these results. There are undoubtedly more obstetrical difficulties met with in a mixed population such as we have in this country than in a homogenous, healthy, mostly rural population, such as the Scandinavian countries have. Further we must bear in mind that "contrary to common expectation the United States with all its wealth and the attention that is being paid to the cause of public health ranks tenth in (total) mortality. Nine countries have lower (total) death rates than that of the

United States and these in order of priority are: New Zealand, Holland, Australia, Norway, Sweden, Canada, England and Wales, and Switzerland." (*Outline of Preventive Medicine*, Paul B. Hoeber Inc., New York, p. 29.) There is not, however, the same spread between the highest and lowest total death rates as there is between the highest and lowest maternal death rates. The total death rate in the United States in 1926 was 12.1 per 1000, estimated population. New Zealand had the lowest rate of 8 per 1000. Our total death rate is thus one and one-half times that of New Zealand; but our maternal death rate is two and one-half times that of the Netherlands. Our puerperal sepsis death rate is three and one-half times that of the Netherlands. Puerperal sepsis is thus a big factor in our maternal mortality rate.

Why is it that with all our present day knowledge the incidence of and mortality from puerperal sepsis remains pretty much as it was before the days of Pasteur and Lister? That this is so is amply proved by statistics. From a study of the whole vast problem of puerperal sepsis it seems to emerge that there are two main modes of infection, one by contagion, which occurs in the same way as does scarlet fever, measles, or small pox, and the other by direct inoculation into wounds such as occurs in ordinary surgical practice. Contagion may assume local epidemic form and affect numbers of patients who have had normal unaided and uninterfered with deliveries, or it may affect a single isolated patient just as scarlet fever not infrequently does. We all know of cases of puerperal sepsis occurring in patients who have had normal deliveries without tears and on whom no vaginal examinations have been made. To explain such cases it has been assumed that the infecting organism was present in the vagina or cervix prior to delivery. We know that many pregnant women harbor streptococci in the cervix but recent research seems to indicate that these are for the most part harmless and do not cause infection. The discussion of this would lead us too far afield so I shall not mention it further than to

say that in an exceptional case such autogenetic infection may occur but that it does not explain the majority of infections in uninterfered with cases. In the majority of these a virulent streptococcus is in some way introduced into the uterus and genital canal during or soon after labor. It may reach there from a focus in some other part of the patient's body such as a septic tooth, tonsil, or the respiratory passages, or it may gain access from outside. We are familiar with streptococcal epidemics which affect the respiratory passages, the throat and ear, the digestive tract. When such cases are prevalent streptococcal puerperal infections are liable to occur. The medical attendant may be no more responsible for these than he is for cases of bronchopneumonia or acute mastoid. The total elimination of puerperal sepsis is thus to my mind an unattainable ideal.

Now it was this type of contagion, uncontrolled by any precautions, which accounted for a large part of the septic puerperal mortality in by-gone days. On a large scale it has been practically eliminated from the modern world and yet the total septic death rate remains the same. Even allowing that streptococcal infections in general are more common than they used to be (we have no way of proving this of course) the facts stated would seem to indicate that there has been no marked diminution of cases in which infection is introduced by direct inoculation of puerperal wounds.

What are the possible explanations? May one explanation be that there are more puerperal wounds to-day than there were fifty years ago, more women with contused and traumatized tissues, more women shocked, more women suffering from severe blood loss, as the result of labor. I do not think there can be any doubt that there is a greater incidence of all these conditions to-day than there was fifty or one hundred years ago. Young in a recent publication in which he reviews some old Edinburgh statistics states that in the Royal Maternity Hospital Sir James Simpson used forceps only once in 472 cases. The

maternal death rate was a little lower in his time than it is in Scotland to-day in spite of other procedures such as manual dilatation of the cervix, the use of lard as a lubricant for the maternal passages, and in spite of a complete absence of antisepsis and asepsis in the conduct of labor.

The above mentioned procedures, which none of us practice to-day, must have accounted for much of the septic mortality of seventy years ago. But we have apparently substituted for them others which may counterbalance. The two I would specially mention are anesthesia and instrumental delivery. I mention them together because one is very often the result of the other. The women of to-day and especially the American women will not stand the pain that their grandmothers and great-grandmothers did. They demand relief—they demand more than relief—they demand an absolutely painless labor. Now this must carry with it an increase in the number of operative deliveries. Operative deliveries, taking them all over the country, carried out by competent and incompetent operators, in hospitals with perfect aseptic technic and in homes with no equipment or technic at all result in more traumatism than do normal deliveries and so increase the septic death rate.

That trauma increases morbidity is shown by the following figures from a review of 964 consecutive deliveries during 1926 in Sloane Hospital for Women, New York. In 442 of these cases there was no laceration and the morbidity rate was 9.7 per cent. In 251 cases there was a first degree laceration and the morbidity was 10.5 per cent. In 77 cases there was a second degree laceration and the morbidity rate was 18.6 per cent. In three cases there was a third degree tear and the morbidity rate was 100 per cent. Incidentally it is interesting to note that there was a higher morbidity rate in patients on whom episiotomy was done than in those who had a second degree tear. That excessive post-partum hemorrhage increases the liability to sepsis is shown by the same survey. In 298 patients with a post-partum hemorrhage of less than 200 c.c. the morbidity rate was 7.05 per cent. In 492 patients with

post-partum hemorrhage between 200 and 300 c.c. the morbidity rate was 13.2 per cent. In 106 patients with post-partum hemorrhage of more than 300 c.c. the morbidity rate was 21.7 per cent. Deep anesthesia undoubtedly tends to post-partum hemorrhage.

In such statistics as are available it is amply proved that as the incidence of instrumental deliveries is lowered so is the septic death rate. In 1927 the midwives of Queen Victoria's Jubilee Institute in England had 53,502 deliveries. In only 6 per cent were doctors called on to use forceps. The total death rate from sepsis was 0.12 per 1000, 1/10th of the general rate for England. In a total of 47,503 successive cases in the outdoor and indoor practice of the East End Maternity Hospital, London, England, forceps deliveries were 2 per cent and the septic death rate 0.10 per 1000—less than 1/10th of the death rate for England generally (Young). Take along with these figures the fact that in Holland and in the Scandinavian countries the maternal mortality rate and the puerperal septic mortality rate are the lowest in the world and remember that 85 per cent of women in those countries are delivered by midwives who do not use forceps and I think we have a pretty strong argument that operative delivery is accountable for a very large part of our present maternal septic mortality, and that the maternal deaths from this cause may just about counterbalance the lives saved as the result of the introduction of antisepsis and asepsis, and of our improved prenatal care.

The figures quoted seem to give us one lead at any rate as to how our present mortality might be reduced, viz., by abstaining from active interference with labor except on definite indications. It is in the formulation of these indications that we meet with difficulty. In complications such as placenta previa, or accidental hemorrhage, gross contraction or deformity of the pelvis, we must interfere to save the mother's life. In such cases, undoubtedly maternal mortality has been reduced. But these constitute only a very small percentage of present day reasons for

interference. By far the commonest one is the demand on the part of the patient to be saved pain and to have labor shortened. The second commonest is the inability of the doctor with all his other work pressing upon him to spend the time waiting for normal delivery.

The demand for painless labor on the part of women must carry with it a penalty. Magazine articles and the lay press have spread the idea of painless labor but they have not mentioned the penalties. It is time that women were informed of them. In demonstrating that the pain of labor could be mitigated by the use of chloroform Sir James Young Simpson conferred on women a priceless boon. Since his time other analgesics and anesthetics and other methods of administration have been discovered and devised. All of them have to be used with discretion and judgment. None of them used indiscriminately are free from danger, and the great danger is that they so slow up or stop labor pains that instrumental delivery becomes a necessity.

We come now to what I named the second commonest indication for operative delivery in present day practice—the inability of the practitioner to give the time to wait for normal delivery. At this point I know I am entering upon debatable ground and may say things with which many of you will disagree.

I believe that the maternal mortality in this and in every other country would be very materially reduced if the practice of Obstetrics were in the hands of thoroughly trained midwives working in conjunction with and under the direction of properly trained doctors.

Or to put it another way, every doctor practising Obstetrics should have associated with him one or more trained midwives who would conduct the delivery of his normal cases. I make this statement from a knowledge of conditions on this continent and in Scotland. After ten years of practice and of observation in Canada I returned to Scotland and in my inaugural address at the University

of Edinburgh criticized adversely the midwife system. Four years of observation in Scotland and a study of figures from other countries in Europe have made me change my mind to the extent that now after three years in the United States I make the foregoing statement.

I believe that such a system would work out not only to the benefit of the patient but to the economic advantage of the doctor. To the latter would belong the whole responsibility of prenatal care and the determining of the ability of the patient to go through a normal labor. He would be called upon if any difficulty arose in labor, if any injury required repair, or if any complication arose in the puerperium. He would examine for and correct any abnormality, such as a retroversion, two or three weeks after delivery. This is not theory, it is being worked out in practice. One Scottish doctor informed me that since he conducted his work in this way he has reduced his operative deliveries to 3 per cent, he has fewer puerperal complications, he has time for reading and attendance at medical meetings, which he never had before, and he is financially better off.

And if we stop to think for a moment, what I am advocating for the general population is practically the type of obstetrics that is being done for our better class patients in hospitals. When our patient enters a well organized and equipped hospital for her delivery she is under the direct observation of trained nurses and interns. They look after her during the first stage and early part of the second stage just as the midwife does. The attendance of the obstetrician is only required at the actual time of delivery or in order to administer anesthesia for some time prior to it. And if women here could be brought back to the attitude of the Scandinavian woman, who does not think anesthesia desirable if it can possibly be done without, the attendance of the obstetrician would be of even shorter duration. The only way then in which present day hospital practice differs from midwife practice is that in the former the Obstetrician actually receives

the child as it emerges from the patient's body. The properly trained obstetric nurse or midwife can do that just as well as, and in many cases better than, the man midwife.

I know that in making a statement like this I am laying myself open to criticism so let me amplify it a little.

First of all by a trained midwife I mean a nurse who has had a full general hospital training and who subsequent to that has had at least a year's training in the delivery room, wards, clinic, and outdoor practice of a maternity hospital. With such a training she ought to be able to act as obstetric technician to a doctor.

The doctor with a busy practice has his office nurse and technician who does his X-ray work, his blood counts, and his chemistry. She does these things better than he can do them. It would be physically and economically impossible for him to do them himself. Now—and I say this from first hand knowledge—a nurse can become just as expert and reliable in conducting a normal delivery as can a technician in doing a blood count or a blood chemistry. If the busy practitioner whose practice included a considerable number of home or hospital deliveries had the assistance of such an obstetric nurse he could go about his other professional duties secure in the knowledge that his patient in labor was being well looked after, and that he would only be called upon if the efforts of nature failed.

Nowhere in the world is private medical practice better organized than in this country. Nowhere in the world are women better educated regarding the need of prenatal supervision by a properly qualified doctor. It would be a disaster if this attitude were to change. The criticism of midwife practice in other countries is that no adequate prenatal care is given. Here I think there is a great opportunity to graft upon our present system of practice all the best features of the best type of midwife practice

The alternative to the trained midwife system is the provision of hospital accommodation for all obstetric cases. If such an aim were attained would it solve the problem? Does the aggregation of obstetrical patients in large institutions add to the danger of contagion? I think it unquestionably does. Here again I speak from bitter experience. Young, whom I have already quoted, also thinks so. Dr. Julius Levy, Director of the Child Hygiene Division of the Department of Health of the City of Newark, New Jersey, in a personal note writes "I would call your attention to the fact that although in ten years the percentage of births attended by midwives (in Newark) has been reduced by 50 per cent the maternal mortality rate for the city is more than three times greater than it was in 1918 and has shown practically no reduction in the last few years. You will find also that during this period there has been no reduction in the stillbirth rate. It is reasonable to believe that there has been a shift in the population in the last six or seven years due to immigration laws and the migration of the colored from the South. This may have had some influence.

"You will be interested in the report I made last year to the American Public Health Association in which I showed that although hospitalization of obstetrical patients in Minneapolis had increased from 23 per cent to 78 per cent there had been no reduction in the puerperal sepsis rate, in infant deaths on the first day, while there had been an actual increase in the deaths associated with injuries at birth. A similar chart was presented for Newark which showed that although the percentage of cases delivered in hospitals had increased from 10 per cent to 50 per cent and the percentage delivered by midwives had been reduced from 48 per cent to 23 per cent the same state of affairs existed as in Minneapolis."

The mere provision of hospitals is not enough. The same type of meddlesome midwifery can be practised as easily in a hospital as in a home—in fact the temptation to

interfere may be even greater for the better facilities provided may give a feeling of false security.

If it were economically possible to supply proper hospital accommodation for every parturient woman in this country and economically possible to have a trained obstetrician to whom time was no object in constant attendance on every such woman we should have nearly ideal conditions.

For a certain section of society this is economically possible, for a very large section it is not. For this latter there must be some sort of compromise arrangement. What is the best compromise—the services of a doctor whose economic value is such that he can give only a limited time to his patient and may have to interfere unnecessarily or, the services of a trained obstetric nurse who can give her whole time to the job and who, in normal cases, can be as efficient as the doctor? My own choice would be the latter. I should like to see every obstetric hospital with a staff of trained midwives so that when the doctor sends in his patient (whom he has followed all through her prenatal period) he has the assurance that a normal delivery can be conducted in his absence. I should like to see available for every doctor who practises domestic obstetrics—whether in the country or in the city—a trained midwife who would remain in the home during labor and would be capable of conducting a normal case.

Every country is concerned over maternal mortality. Recently the British Medical Association through its Council submitted to the Ministry of Health in Britain certain recommendations regarding the training and employment of midwives. One of the paragraphs reads:

“The Association believes that the ideal thing would be the provision *ab initio* for every pregnant woman of a midwife and a doctor, the latter taking complete responsibility, ante-natal, natal, and post-natal, for the case, attending at the confinement if thought necessary by himself or if desired by the patient, or if sent for by the midwife on her finding some abnormality. It is believed that such joint provision, if it could be achieved, would vastly improve the practice of midwifery and would thereby render it

safer. Such a provision would ensure medical supervision and responsibility throughout the pregnancy and after the confinement, ensuring skilled advice for normal cases and attendance for abnormal; and would provide for the mother that trained nursing attendance after the confinement which is so important and which so many women do not get."

The whole question is first and foremost an economic one. This country is bound to take cognizance of the great wastage of valuable lives resulting from childbirth and legislators are going to seek a remedy. They are going to ask the advice of our profession as to what form that remedy should take. Are we prepared to give that advice? Are we going to advocate more and more hospitals and nothing more or are we going to inform ourselves a little more about the trained midwife system and so be in a position to say whether or not the grafting of it onto our present practice is likely to be beneficial?

Throughout this talk the word "Midwife" has occurred frequently. This word conjures up to the minds of the laity and of the medical profession in this country the picture of a woman totally untrained, frequently dirty, and usually uneducated, the type of person who in Britain is called a "handy woman" or in vulgar parlance a "howdy." Now that is not the woman I have been speaking of. I have been speaking of an educated, hospital trained, disciplined, and competent nurse. I have called her a trained obstetric nurse or an obstetric technician but neither of these designations is apt. I am sure something better can be found. Something better must be found, for so long as that word "midwife" remains, the discussion of this whole problem will be prejudiced.

And further, let me say that the scheme of coöperation between doctor and obstetric technician would not take away from the dignity of obstetric practice. The capacity to recognize and to treat complications during pregnancy, to form a prognosis of labor, and to undertake the surgical treatment of abnormal cases can only be acquired as the result of a thorough training—more thorough than is provided by most medical schools to-day. To be able

to do these things well means the possession of sound clinical judgment. With this aspect of obstetric practice emphasized and the tedium and loss of sleep involved in waiting upon numbers of normal deliveries removed, the practitioner would find obstetrics one of the most interesting instead of—as is so often the case—one of the most irksome parts of his daily work.

So far there has been no concerted effort made in this country to train the best type of midwife. The ideal which the medical profession and health authorities have had before them was the provision of adequate medical attendance for every parturient woman. We all know that this ideal has not been realized either in our urban or in our rural communities. The untrained woman has continued to ply her trade with or without the recognition of Boards of Health. Those who have studied present conditions are convinced that not for many years to come, if ever, will it be economically or in any other way possible to supply a doctor for every woman in labor. It should be possible to supply to every woman proper medical prenatal examination and supervision. Should our efforts then not be directed towards organizing the latter service and to training women who, under medical supervision, would conduct such normal labors as cannot be undertaken by the doctors? In New York City there is a School for Midwives in connection with Bellevue Hospital but it trains only a small number and does not attract the educated and high type of woman we should like to see applying for admission. There is no school in this country in which a registered nurse who wishes to get midwifery training to qualify her for work in the foreign mission field can receive instruction. These individuals have to go to Britain or some European country for their education. One of the obstetrical hospitals here has practically decided to establish a School of Midwifery. There will be no difficulty in securing enough pupils of the type I have just mentioned to fill it. If it proves a success I see no reason why, later, that hospital and others should not undertake

the training of nurses in midwifery for work at home. The Hospital of which I am speaking is making it a condition of admission that the candidate be a registered nurse. It is questionable whether a sufficient number of registered nurses would want to undertake active midwifery work. That difficulty has been experienced in Britain and on the European continent. There the great majority of the practising midwives have had no general hospital training but they have to be well educated women and they undergo a longer course of training than do the registered nurses. It is this type of woman which forms the backbone of the midwifery service, the nurse midwives filling the posts of instructors and supervisors. It is an anachronism in this country that in those states which recognize and supervise midwife practice the great majority of midwife inspectors are registered nurses but have had no training in midwifery. If for no other purpose than the training of these supervisors we require Schools of Midwifery here.

But I must not allow myself to go into further detail. My purpose is served if I have interested you in the problem which confronts us to the extent of making you feel that it is one requiring serious thought on the part of the leaders and of the general body of the medical profession. If any change in the established practice of medicine is desirable that change should be made by us from within and not forced upon us by lay opinion or legislative action from without.

WILLIAM AND JOHN HUNTER *

A STUDY IN CONTRASTS

FRANCIS R. PACKARD
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The lives of the Hunter brothers extended over exactly the same number of years, William, born in 1718, and dying in 1783; John, born in 1728, dying in 1793. Their early training differed greatly. William was destined for the ministry and was sent to Glasgow University at the early age of thirteen years. After studying there for five years he gave up the gown for the scalpel and began to study medicine with William Cullen, with whom he worked for three years, also attending some courses of lectures at the medical school of the University of Edinburgh. In 1740 he went to London where he worked first under Smellie, the leading obstetrician of his day in London, and then with James Douglas, the discoverer of "Douglas' pouch" of the peritoneum. He studied anatomy also under Frank Nichols, Mead's son-in-law and one of the best teachers of his time. After going to Paris and studying anatomy in Paris, William Hunter returned to London and in 1746 started giving private courses in anatomy, "in the same manner as at Paris," which meant that the students were given the opportunity actually to dissect and make anatomical preparations on the human body, instead of, as had heretofore been the case in London, being taught by means of dried preparations, casts and drawings. His school was successful from the start. John Hunter was a boy of thirteen when his father died. His mother was too indulgent and he was allowed to do pretty much as he pleased and not given any very regular schooling. In 1748 he asked William to take him into his school and from that time for eleven years he passed the time in his brother's school, except during the summer season when the school was closed and he worked at surgery, first in

* Abstract of an address read before the Section of Historical and Cultural Medicine, March 12, 1930.

Chelsea Hospital, later at St. Bartholomew's and finally at St. George's Hospital. The characters of the two brothers were essentially different. William was sensitive, refined and cultivated. He had received an excellent education at Glasgow and his early training as a man-midwife with Smellie and Douglas had tended to give him a correct professional bearing. He frequented the salons of the literati and the halls of the learned societies, collected rare books, statues and works of art. John on the other hand passed his time in the dissecting rooms or hospital wards and was not at all choice in the selection of his companions. He was a hard drinker in these years and given to coarse language and the frequent use of oaths. John's anatomical skill was early recognized not only by his brother who appointed him demonstrator in his school a year after he joined him, but also by others for, in 1753, he and Percival Pott were elected to read the anatomical lectures at Surgeons' Hall, a remarkable tribute to his reputation as Pott was already surgeon at St. Bartholomew's and John Hunter had only begun his studies five years before. Meanwhile William Hunter was the leading obstetrician in London. He was surgeon-midwife to Middlesex Hospital and to the British Lying-in-Hospital, and Physician-Extraordinary to Queen Charlotte.

It was during the period between 1748 and 1759 that the Hunters did their most remarkable work in anatomy. The two brothers were a wonderful team to run an anatomical school. William Hunter was a scholar, thoroughly grounded in anatomy and an eloquent lecturer. John was rough of speech, uncouth in manner, and an impatient master, but unequalled in his knowledge of practical anatomy and skill as a dissector. During these years there is no doubt, as candidly acknowledged on many occasions by William, John did most of the practical work upon which William based his lectures, full of original views.

The first publication which was made of their researches was William Hunter's "Medical Commentaries" which was put forth in 1762. It contained the demonstrations of the

accurate anatomy of the lachrymal ducts and the tubuli seminiferi; the first actual proof of the real nature of congenital hernia, and the demonstration of the fact that the lymphatics constituted a separate absorptive system. Unfortunately this book is marred by invectives against the Monros whom William accused of stealing his ideas and the fruits of his labors.

In 1759 John's health was impaired and he obtained a commission in the army and went on the expedition against Belleisle, and later into Spain. He returned to London in 1763, but for some unknown reason did not resume his position as his brother's assistant. Instead he branched out for himself. In 1768 he was elected surgeon to St. George's Hospital and after Percival Pott's death he was recognized as the foremost London surgeon of his time. Besides having house-pupils he gave courses in surgery and anatomy. In 1767 he was elected a Fellow of the Royal Society, three months before William was thus honored. Yet in spite of various indications of a rift in the lute the brothers were on friendly terms as William allowed John to give some lectures in his rooms as late as 1777, and they saw one another frequently. The final break in their fraternal relations came in 1780. Six years before, in 1774, William Hunter had published his great work the "Gravid Uterus," printed by Baskerville, with superb illustrations by Van Rymsdyk. In it he described for the first time the correct anatomical relations between the uterus and the placenta. John Hunter made no public comment on the work until 1780 when he wrote a letter to the Royal Society in which he claimed that he had first shown this relationship to his brother in 1754, and that in the latter's book he had appropriated the discovery and made no mention of his, John's, part in it. William Hunter wrote a reply also addressed to the Royal Society but that body refused to take part in the quarrel and did not publish the letters in their transactions. No one has ever satisfactorily solved the mystery as to why John waited six years before he published his complaint. William died March 30, 1783.

John visited him as he lay on his deathbed, but the reconciliation came too late. John did not attend his brother's funeral. Ten years later, October 16, 1793, John Hunter died in an attack of angina pectoris. Both brothers left huge collections of great value and interest. William's contained not only anatomical preparations but a magnificent library of manuscripts and books, and a great collection of antique gems and objects of art. He bequeathed it to the University of Glasgow. John Hunter's collection of specimens illustrating human and comparative anatomy and pathology was purchased by the Government and given into the custody of the Royal College of Surgeons of London. Both of these collections are of the greatest value and they illustrate the difference in the characters of their two collectors as clearly as could be wished. William the scholar, dilettante and art collector, as well as anatomist; John the original investigator, whose own hands prepared or directed the preparation of most of the specimens contained in his collection.

SUGGESTIONS FOR A NATIONAL NOMENCLATURE OF DISEASES

H. B. LOGIE

Executive Secretary, National Conference on Nomenclature of Diseases.

The formation of the National Conference on Nomenclature of Disease in March 1928 was primarily a response to the demand for uniformity of records and statistics of diseases and morbid conditions. There are a number of nomenclatures in use in the United States, some prepared under governmental auspices, others by certain of the larger hospitals, or by individuals. None of these has been nationally adopted. The "Nomenclature of Diseases"¹ prepared by the Royal College of Physicians has been widely used in Great Britain. The International List of Causes of Death has been the official standard for a varying time in several countries and has been officially adopted by the Bureau of the Census and by most of the individual States of the Union since 1900. It serves as a basis of comparison of mortality rates, but is not suited, either in scope or terms, to the compilation of morbidity statistics. There are also nomenclatures for use in individual specialties, compiled largely or entirely to meet limited requirements without reference to other special or general nomenclatures. It is evident that records compiled on such diverse bases are not comparable.

The general dissatisfaction with existing conditions came to a head in the New York Academy of Medicine, and was first given serious consideration in the Committee on Public Health Relations. A sub-committee was appointed to determine ways and means of providing all physicians and hospitals with a standard nomenclature. As a result of their deliberations a meeting was called by

¹ Royal College of Physicians: *The Nomenclature of Diseases*, London, Wyman and Sons, Ltd., (Fifth edition) 1917.

the Academy on March 22, 1928. Invitations were issued to the American College of Surgeons, the American Heart Association, the American Hospital Association, the American Medical Association, the American Public Health Association, the American Statistical Association, the Association of American Physicians, the Bureau of the Census, the Medical Department of the Army, the Medical Department of the Navy, the United States Public Health Service, and to the larger New York Hospitals.

After those present had organized and formed the National Conference on Nomenclature of Disease, the following governing principles were adopted:

- "1. The conference will cooperate with the Bureau of the Census in making an alphabetic arrangement of diseased conditions* as the standard work on Nomenclature.
- "2. A comprehensive detailed classification of diseased conditions is to be prepared, employing the terms given in the Standard Nomenclature.¹
- "3. An abridged classification of diseased conditions is to be prepared, based upon the detailed classification.
- "4. The comprehensive detailed and the abridged classifications are to be prepared by a Subcommittee of this Conference with the coöperation of the interested national societies and associations and of the federal government services.
- "5. Both classifications should be based upon the detailed International List of Causes of Death as far as advisable and should use the same title numbers."

* The term "diseased conditions" is understood to include all pathological conditions, injuries, poisonings and intoxications.

The preparation of a detailed and an abridged list would make it possible for special hospitals to use the detailed list for the specialty and the abridged list for all other diseases. In this way either of the two lists could be used or they could be arranged in various combinations to meet the needs of the large general hospital, the smaller general hospital and the hospital concerned with any specialty.

¹ Department of Commerce, Bureau of the Census: Standard Nomenclature of diseases and pathological conditions, injuries, and poisons for the United States (First edition) 1920.

For their own records physicians might use either one or, if they were particularly interested in special diseases, might adopt the plan followed in the special hospital.

The Executive Committee was chosen to represent the wide interests and affiliations of the organization. On it were delegates from the American Public Health Association, the American Statistical Association, the American Hospital Association, the American Surgical Association, the Bureau of the Census, the United States Public Health Service, one New York Hospital, and the New York Academy of Medicine.

At the outset it was clear that a national nomenclature must be prepared by those who were to use it. As finally constituted, the National Conference is composed of delegates from national organizations representing the various specialties in medicine and surgery, and from the most prominent clinical statistical organizations, governmental and other. It is, therefore, not a restricted group of men who wish to impose a nomenclature upon American physicians; it is a coördinating center and a clearing-house for professionally qualified ideas on nomenclature.

A special committee known as the Committee on Clinical Records of the American Hospital Association was organized independently of the National Conference. It consisted of representatives from the American Hospital Association itself and from the American College of Surgeons, the Council on Medical Education of the American Medical Association, the American College of Physicians, and the Association of Record Librarians of North America. Since the work of this committee parallels that of the National Conference, the two activities being complementary, there is need for a liaison between the two groups. The President of the American Hospital Association (formerly the Chairman of the Committee on Clinical Records) is a member of the Executive Committee of the National Conference.

the organization of the National Conference depended

on the vision of many men whose names appear in the minutes of that inaugural meeting and on the devotion of the members of the Executive Committee. To the United States Bureau of the Census and the New York Academy of Medicine belongs much of the credit for initiating and fostering the movement. As the work grew in volume, office space and funds were required. The former was supplied by the New York Academy of Medicine; and the Commonwealth Fund, being apprised of the nature and importance of the work and the national support it was receiving, generously provided the necessary financial assistance.

A year after the foundation of the National Conference, the world-wide demand for a common method of naming diseases and recording their incidence found expression in a notable document, a resolution passed at the Conference of Expert Statisticians held in Geneva under the auspices of the Health Section of the League of Nations. The resolution is quoted not only because of its importance in the progress of medicine but because it presents in terse form the argument for a "systematic classification of the names of diseases" such as the National Conference is in process of preparing, and because it reveals the present work of the National Conference, important as it is in itself, as part of a great international effort to lighten the burden of disease and lengthen the span of life. The resolution follows:

- "A. That each country be requested to prepare an alphabetical list of the terms descriptive of diseases and pathological conditions used by the physicians serving its population.
- "B. That in view of the great importance of developing comparable morbidity data, for the scientific study of the conditions of life and health in the various countries, and with the hope of providing a basis for the control or prevention of prevalent diseases, each country be encouraged to undertake the preparation and application of a systematic classification of the names of diseases and pathological conditions, according to some such list as the International List of Nosology and Causes of Death as will be determined in October for 1929 and the

category provides an entirely different morbid species, even when the structural or functional end result is apparently identical, because difference in cause determines theoretical, if not always practical, difference in treatment, and in prognosis.

Difference in site often determines difference in morbid species, even when the cause is the same. Chancre is not the same morbid entity as general paresis, either in clinical or legal medicine. The cause, moreover, is not the disease. Hence acute miliary tuberculosis is a different morbid entity from pulmonary tuberculosis or tuberculosis of the adrenal. Tuberculosis is not the morbid species; it signifies clinically only the presence of a cause, or, at the most, only an ill-defined morbid state arising from it. It is only when the field of action of the cause is stated or implied that sufficient data are afforded to define a morbid species. The same is true of syphilis. Whether these distinctions are logical or not, they are the distinctions which medicine has made, not primarily for classification but because they depend on differences, actual or potential, in prognosis and treatment. These distinctions are made, in short, for the purpose of defining the entities about which physicians think and speak and communicate with each other.

It was on this dual basis, topographical and etiological, that a plan was suggested to the National Conference for the preparation of a classified list of diseases. It is summarized here, not as a final pronouncement, although it has had the official approval of the Executive Committee of the National Conference, but as a suggestion for discussion and criticism. If the national nomenclature fills its purpose, it will be the uniform guide in all hospitals and for all physicians. Even a tentative plan should be open to the widest criticism before a detailed nomenclature is prepared in conformity with it. The scheme has already been submitted to the coöperating committees and is being discussed with them. It has excited generally favorable comments, one of which is quoted: "If your

arrangement proves as practically useful as it is admirable in theory, it will no doubt serve as a model for future revisions in this country and elsewhere."

According to the principles laid down above, each disease is considered as the result of a cause (or a mechanism when the cause is undeterminable) acting in some tissue, structure, or organ, or in the body generally. It is the common practice in naming diseases (diseases being interpreted in the broad sense of disturbance of structure or function) to state both site and etiological category: tuberculosis of the lung, fracture of the femur. In others they are implied or understood: typhoid fever, exophthalmic goiter, diabetes. In still others, and indeed in some of the examples just given, there is some difficulty in determining in what structure the disease is most manifest. Strictly speaking, the entire body is the site of all disease, but, for purposes of the classification submitted and in accordance with clinical practice, a specific site has been assigned whenever possible; when necessary, the disease has been referred to the body as a whole. Ewing¹ discusses the topographical classification of tumors as follows:

"The morphologist speaks of cancer of mamma, larynx, uterus, etc., as one and the same disease, while the clinician properly conceives of mammary cancer, laryngeal cancer, uterine cancer, etc., as quite distinct clinical entities. There is much practical value in emphasizing the regional point of view, and as knowledge advances it may well prove that the strictly histological grouping of many tumors is based on structural resemblances which are less significant than are now supposed."

The division of the body into anatomical systems and the subdivision of these into regions, structures, and organs has provided a classification of the recognized anatomical sites of disease. In Table 1 only the primary divisions are shown; the secondary divisions occupy too much space to be presented in this communication.

¹ Ewing, James: *Neoplastic Diseases*, Philadelphia, W. B. Saunders Company, (Third edition) 1928, p. 26.

TABLE 1

ANATOMICAL SITES OF DISEASE

0. Diseases of the body as a whole and those not affecting a particular system exclusively.
1. Diseases of the skin and its appendages, and of the subcutaneous areolar tissue.
2. Diseases of the bones, joints, bursae, ligaments, muscles, tendons, and fascia.
3. Diseases of the respiratory system.
4. Diseases of the cardio-vascular system and lymphatic channels.
5. Diseases of the blood and blood-forming organs, and of the lymph-nodes.
6. Diseases of the digestive system.
7. Diseases of the urinary system.
8. Diseases of the genital system.
9. Diseases of the endocrine system.
- x. Diseases of the nervous system and organs of special sense.

The etiological categories (Table 2) include more than the known causes. Indeed they might more accurately be called "Categories of causes and mechanisms." Achard¹ discusses this question as follows:

"It is the idea of the morbid cause which must dominate our classifications today. This cause is not always known. So there are in our nosology provisional morbid entities, enumerated according to group symptoms or according to the lesions of an organ or humoral alterations, and which usurp for the time being the rank of diseases. Actually they should be considered syndromes, that is to say, as simple symptomatic manifestations, anatomical or humoral, of diseases sometimes very different. These are not, as one would be tempted to believe, vain theoretical considerations. This etiological classification is the productive basis of etiological therapeutics, alone capable of attaining the eradication of the disease by curative or preventive measures. The ideas of the syndrome, of anatomical localization, of humoral alteration, permit only palliative therapeutics which, though doubtless not without value, generally remain incomplete."

With much of this statement one must agree. The method which has been suggested to the National Conference, however, is based on a more practical view of the

¹ Achard, Ch.: La classification des maladies, *Paris médical* 17: pp. 245-250, 1927.

unknown causes. It is surely logical to group new growths together since they have so many common properties and represent a more or less constant pathological mechanism. The view has been taken that, when the cause is unknown, diseases should be grouped according to similarity of mechanism, both structural and functional. The structural changes have been given the preference because they can be described in more general terms than the functional and thus serve as a basis of classifying diseases of all organs and tissues. There are no general terms in which jaundice, azotaemia, hyperacidity, hypertension and arrhythmia can be defined; but the varieties of chronic inflammation manifested in different organs or in the same organ can be classified in general terms. The functional manifestations are not ignored when they can be used to define a morbid entity more particularly; and in one category (Category X) they constitute the basis for an entire group of diseases. The plan, then, is not to ignore such bases of classification as present knowledge can provide. The chronic non-infective inflammations, for example, are not grouped together as a mere matter of statistical convenience but because it is a valuable and logical step in investigation to set apparently similar phenomena side by side in order to discover first their points of difference and ultimately their similar or divergent origins.

TABLE 2

ETIOLOGICAL CATEGORIES

0. Congenital and hereditary diseases.*
1. Diseases due to infection or infestation.
2. Diseases due to intoxication.
3. Diseases due to trauma or physical agents.
4. Diseases due to circulatory disturbances.
5. Diseases due to nervous disturbances.
6. Diseases due to or consisting of static mechanical abnormalities (obstruction, stone, etc.)

* In the sense of departure from the normal structure or function.

7. Diseases due to disorders of metabolism or nutrition.
8. New growths.
9. Diseases due to causes unknown or uncertain but characterized by reaction (degenerative, infiltrative, inflammatory, proliferative, sclerotic or reparative) to injury of unknown nature; diseases due to involutionary changes or abnormalities.
- x. Diseases due to causes unknown or uncertain but characterized by disturbance of function without known cause or evident structural change.

Certain of the diseases to be classified under Categories 4 and 5 scarcely need to be exemplified. Gangrene of the foot due to obstruction or severance of the femoral artery is a clinical entity, as is paralysis of the wrist extensors due to ancient wound of the musculo-spiral nerve. The classification of certain diseases of organs on these bases is possible now and may be carried out more extensively as knowledge of causation advances.

With Achard's contentions in regard to syndromes one feels in entire harmony. Aneurysm is not a morbid entity because it has a variety of causes each of which constitutes the basis for a morbid entity. Nor is cyst a morbid entity. Cysts arising from different causes cannot, on this account, even fall into the same group. Cyst formation, being the accidental accompaniment of many processes, is not considered a morbid entity at all. Hyperacidity as a diagnosis has met with the fate it deserved, but other functional diagnoses still persist. Azotaemia, glycosuria, hyperglycaemia, cardiac arrhythmia, asthma, and other terms still scramble for the places vacated by coma, dropsy and jaundice. The only form of functional diagnosis allowed in the suggested nomenclature is that used to describe a disturbance of function without known cause and accompanied by no structural change. In this case the concession is made because there are no other terms than functional in which the morbid state may be described. As soon as the cause is determined or any structural change is manifested it will be classified with others similar.

In order to enable the statistician to use this classifica-

tion, a decimal code-system has been suggested. The anatomical systems number eleven, X being used as a digit in addition to those from 0 to 9. Each system (primary anatomical division) would be divided into eleven (or fewer) organ groups, such as Mouth and Stomach under System 6 (Digestive System). Each organ group in this secondary division would be divided into eleven or fewer ultimate "anatomical sites of disease." The code-number of each site would be composed of the numbers of the primary, secondary and tertiary divisions. Thus all diseases of the digestive system would begin with 6; diseases of the mouth would begin with 61 and of the stomach with 64; diseases of the tongue would begin with 612 and of the pylorus with 645.

The code-numbers indicating the etiological factor would depend on similar primary, secondary and tertiary divisions. This part of the code-number of the disease would follow that for the anatomical site. Thus the first "etiological" digit would be 1 when the disease was due to infection. In the present classification of the infections, division 4 is Protozoa, and number 7 under that heading is *Treponema pallidum*. Hence any disease due to syphilis would have as its "etiological" code-number 147 (interpreted as: infection—protozoa—*Treponema pallidum*). Syphilis of the tongue would therefore have the code-number 612-147. This would provide not only a code-number made up of significant digits but a system of cross reference, since the disease would be classifiable (by digit) not only with all diseases of the tongue but with all syphilis. Grouping of statistics could be carried even beyond any legitimate need, since the same significance would attach to 6 in all code-numbers, as it would to 61 and to 612. Similarly 1 (in the fourth position) would always indicate infection, 14 protozoan infection. Thus statistics could be assembled, by mere association of code-numbers, concerning diseases of the digestive system, diseases of the mouth, diseases of the tongue; concerning syphilis in general; concerning protozoan infection in

BLOOD TRANSFUSION BETTERMENT ASSOCIATION

PURPOSE

The chief purpose of the Blood Transfusion Betterment Association is to supply the hospitals and physicians of New York City and, as far as practicable, the surrounding districts of New York State and New Jersey, with properly tested blood donors at any time of day or night with a minimum of delay. The Association also supplies sera for blood grouping and performs blood groupings on request. In addition the Association proposes to foster improvements in the methods of blood transfusion and studies concerning the blood groups, and to stimulate post-graduate training in all phases of blood transfusion, including grouping, matching, and transfusion technique. It is likewise within the aims of this Association to raise funds to be applied for the payment of transfusions performed for the benefit of impecunious patients.

ORGANIZATION

The Blood Transfusion Betterment Association is a non-profit making New York State Corporation and came into existence by the efforts of the Committee on Public Health of The N. Y. Academy of Medicine. It was incorporated in 1929 under the Membership Corporations Law, and is governed by a Board of Trustees elected annually by the representatives of hospitals which hold active membership in the Association. All the medical policies of the Association are formulated and supervised by a Board of Medical Control.

FINANCIAL SUPPORT

As the Association has no endowment funds, its operating revenues are derived from three sources: voluntary donations, membership dues, and fees from the donors supplied by the Association.

OPERATION OF THE BLOOD DONOR SERVICE

The Association maintains a blood donor service which is located at 10 East 103rd St., New York City (telephone, Atwater 6733). The plan of operation is as follows:

1. The donors selected must pass a rigid medical and laboratory (Wassermann and hemoglobin) examination; they must weigh at least 150 pounds and possess suitable veins at the elbow; they must be intelligent and of good character (by appearance); they must be accessible by telephone day and night.

2. The blood group of each donor is determined by an independent examination by two qualified workers, each using a different method (one testing the cells with known group sera and the other testing the serum with known group A and group B cells).

3. The donor is re-examined previous to each succeeding transfusion, especially to exclude an intervening (venereal) infection and to make sure that the hemoglobin content of his blood is not below 85 per cent of normal.

4. The donors are expected to be prompt, courteous, and presentable in appearance, and the Association wishes to be informed immediately of any infraction of these rules by a donor, or of any other criticism of the service.

5. In order to give the best service, the Association must have the following data when a call is made for a donor:

- (a) Name of patient; address or ward or room number.
- (b) Name of person making the call; name of physician responsible for the transfusion.
- (c) Group of the patient. (In view of the conflict in the two numberings, the Association prefers the international designations of the groups by letter (see enclosed table). If, however, the numbers are used, it is advisable either to add the letters or to indicate, in case group I or IV is desired, whether the "universal donor" or the "universal recipient" is meant).

- (d) Probable quantity of blood which is to be taken.
- (e) Time at which donor is wanted.

6. The Association expects that hospitals and individual physicians will utilize its blood donor service regularly for all blood transfusions and not merely for rare groups.

7. The Association has adopted the standard rate of charges for transfused blood which is general throughout the city and vicinity; namely, \$10 per hundred cubic centimeters, the minimum charge being \$25. Hospitals and physicians are requested to pay the donors in accordance with this schedule, retaining 10% which goes toward the maintenance of the service. At the end of the month, the Association renders a bill for the retained fees.

In unusual emergencies, the service has occasionally been asked to have the donor use a taxicab, and this expense has been met by the patient or by the hospital. If a donor who belongs to the group called for is sent and not used for any reason for which he is not responsible, he is to be paid the sum of \$2.50. When there is an apparent incompatibility, the particular sample of patient's blood may be sent to the office which, for an additional fee of \$5.00, will undertake to find a suitable donor.

The office of the Association is prepared at any hour of day or night to group a specimen of patient's blood and carry out a direct matching of such a specimen with the blood of the donor that is called, for a fee of \$5.00.

The Association is in a position to supply the hospitals and physicians using the service with high titered grouping sera which will agglutinate the corresponding corpuscles on the slide within one minute. These sterile sera are diluted 1:2 and distributed in rubber stoppered test tubes in quantities of 2 c.c. and 1 c.c. at \$2 and \$1, respectively for each tube for member hospitals. Non-member hospitals and physicians may obtain these sera at a price of \$5.00 for each cubic centimeter. One cubic centimeter of this diluted serum is ordinarily sufficient for about fifteen groupings.

TECHNICAL REMARKS

Minor Reactions. In the opinion of several authors, the slight agglutinations occurring occasionally with cells and serum of two individuals of the same group can indicate some incompatibility of the two bloods, especially in cases of chronic disease. However, these minor reactions have been seen to be without significance in a number of cases observed. Further study of these reactions is needed because they frequently interfere with the performance of transfusions. The Association desires material for such study. In general the phenomenon of rouleaux formation (pseudo-agglutination) is probably without significance in the selection of donors. This reaction is, as a rule, seen only when undiluted serum is used.

Use of Universal Donors. The Board of Medical Control of the Association shares the general preference that donors shall be of the same group as the patient and, whenever possible, supplies such donors on request. Occasionally there is, within a short period, an unusual demand for donors of the two rare groups, such that the list of eligible donors of these groups is nearly or quite exhausted. On such occasions, the Association may offer (without urging this) in substitution, donors (selected on account of the low titer of their agglutinins) of Group O (Universal donors) for group B (III) patients, and group A (II) for group AB (Universal recipient) patients. These substitutions have been made in many cases without untoward reactions.

The amount of blood that can be safely transfused in such cases depends on the degree of anemia of the recipient as judged by the red cell count. It is essential that this figure be given to the office as well as the approximate weight of the patient. The office can then judge the amount of blood that can be safely transfused. It is understood that when a universal donor is requested for a recipient of any other group, or, in case of emergency, for a patient that has not been grouped, this circumstance

will be clearly communicated to the office. It is not advisable to use donors of group O for any other group or a donor of groups A or B for patients of group AB without determining the agglutinin content of the donor's serum. It is inadvisable, likewise, to use a universal donor more than once at short intervals for the same patient of another group, and the office is not in a position to assume responsibility in such a case.

Nomenclature. Because of misunderstandings which occasionally occur, this issue contains a table showing the relation of the three group designations that are in use; the international (Landsteiner) designation by letters, and the two numberings of Jansky and Moss.

	Universal Donor			Universal Recipient
International	O	A	B	AB
Jansky	I	II	III	IV
Moss	IV	II	III	I
Approximate Percentage Occurrence	45	42	10	3

The Association wishes to make it clearly understood that it can be responsible only for the correct grouping, the physical state of the donor, and the proper condition of his blood.

TRUSTEES

The Board of Trustees of the Association are: Dr. Thomas Howell, President; Mr. George F. Sauer, Vice-President; Dr. E. H. L. Corwin, Secretary-Treasurer; and Mr. John F. Bush, Dr. John E. Daugherty, Commissioner J. G. Wm. Greeff, Dr. John A. Hartwell, Dr. T. Dwight Sloan and Dr. DeWitt Stetten.

MEDICAL BOARD

The Board of Medical Control consists of Dr. DeWitt Stetten, Chairman; Dr. Charles F. Bolduan, Secretary; and Drs. David C. Bull, Arthur F. Coca, Edward R. Cuniffe, Edwin H. Fiske, Karl Landsteiner, Max Lederer, Ward J. MacNeal, Reuben Ottenberg, and Douglas Symmers.

THE GRADUATE FORTNIGHT

The Third Annual Graduate Fortnight of the Academy will be held October 20 to 31 on the subject "Medical and Surgical Aspects of Acute Bacterial Infections."

The program as arranged is in two parts—coördinated afternoon clinics to be held in eleven important hospitals of the city, and evening meetings to be held at the Academy.

A large exhibit of anatomical, bacteriological and pathological specimens and research material bearing upon the various aspects of the subjects discussed at the evening meetings, will be held at the Academy during the Fortnight. Many of the exhibits will be demonstrated.

The profession generally is invited to attend.

No fees will be charged for attendance at any of the clinics or meetings on the program.

A complete program and registration blank for clinics and demonstrations will be mailed on request.

EVENING SESSIONS AT THE ACADEMY OF MEDICINE

FIRST WEEK

¹MONDAY EVENING, OCTOBER 20, 8:30

Opening Session

Address of Welcome.

Dr. John A. Hartwell, President, The New York Academy of Medicine.

Focal Infection as the Cause of General Disease.

Dr. Frank Billings, Professor Emeritus of Medicine, University of Chicago.

¹ Program arranged by courtesy of the Section of Ophthalmology.

The fundamental principles which underlie the relationship of focal infection to general disease. The benefits of a correct diagnosis and treatment and the harmfulness of an incorrect diagnosis and management.

The Continued Education of the Practitioner.

Dr. Charles F. Martin, Dean of the Faculty of Medicine, McGill University, Montreal.

A discussion of graduate instruction and some of its methods.

²TUESDAY EVENING, OCTOBER 21, 8:30

Acute Hematogenous Osteomyelitis.

Dr. Fenwick Beekman, Attending Surgeon, Bellevue Hospital.

Its pathology, with special reference to the involvement of the joints, its diagnosis and the present day concepts of treatment.

Acute Infections of the Urogenital Tract.

Dr. Joseph F. McCarthy, Director, Department of Urology, Postgraduate Medical School and Hospital.

Renal and peri-renal bacterial lesions; vesical, urethral, and renopelvic bacterial manifestations, as well as urethral and adnexal infectious processes.

³WEDNESDAY EVENING, OCTOBER 22, 8:30

Infections Arising from Tonsils and Sinuses.

Dr. John Edmund Mackenty, Senior Surgeon, Manhattan Eye, Ear and Throat Hospital.

The general or constitutional symptoms secondary to different types of sinusitis and tonsillitis. Sinus headache. Sphenopalatine ganglion syndrome secondary to neighborhood infections. Blindness from sinus infections. Thyroid reaction to upper respiratory infections. Thoracic reaction to the same.

Infections of the Middle Ear (Acute Systemic Infections from the Ear).

Dr. Isidore Friesner, Otologist to the Mount Sinai Hospital.

The interest generally in systemic infections; the particularly interesting problems of systemic infections of otitic origin; bacteriology, pathological changes; common and unusual symptoms; treatment and results.

² Program arranged by courtesy of the Section of Medicine.

³ Program arranged by courtesy of the Section of Laryngology and Rhinology.

Acute Infections of the Face and Oral Cavity.

Dr. Henry Sage Dunning, Professor of Oral Surgery, Columbia University Dental School.

Occurrence of; types; etiology; diagnosis. Symptoms: local; general. Influence on systemic diseases. Treatment.

THURSDAY EVENING, OCTOBER 23, 8:30

Operative Risks from Infection.

Dr. Frederic W. Bancroft, Surgical Director, Fifth Avenue Hospital.

An analysis of the most common postoperative infections, i. e., wound infections, peritonitis, pneumonitis, septicemia, thrombosis and embolism—their prevention and treatment.

Appendicitis.

Dr. Eugene H. Pool, Attending Surgeon, New York Hospital. A clinical discussion. Classification: Dangers of appendiceal infection; diagnosis and differential diagnosis. Treatment.

Bacteriemia.

Dr. Walton Martin, Attending Surgeon, St. Luke's Hospital. Its significance. Animal experiments which illustrate fate of bacteria in circulating blood; practical deductions.

FRIDAY EVENING, OCTOBER 24, 8:30

Complications Incident to Delayed Diagnosis in Suppuration of the Lung and Pleura.

Col. William L. Keller, Surgical Director, Walter Reed General Hospital, Washington, D. C.

This discussion will include a brief review of acute suppurative pleuritis with complications which include chronic non-tuberculous suppurative pleuritis; tuberculous pleuritis with complications including mixed infection incident to pneumothorax and aspiration; acute lung abscess with complications including chronic lung abscess and suppurative pneumonitis. The discussion will also include a brief review of the tragedies indicative of lost opportunities incident to delayed diagnosis, with lantern slide demonstrations.

Acute Infections of the Gall Bladder and Biliary Tract.

Allen O. Whipple, Director of Surgery, Presbyterian Hospital.

SECOND WEEK

MONDAY EVENING, OCTOBER 27, 8:30

*Program arranged under the auspices of**The Medical Society of the County of New York.**Introductory Remarks on the General Subject of Puerperal Mortality and Its Reduction.*

Dr. George W. Kosmak, President, Medical Society of the County of New York.

Clinical and Pathological Notes on Puerperal Infection.

Dr. J. Whitridge Williams, Obstetrician-in-Chief, The Johns Hopkins Hospital, Baltimore.

A clinical consideration of the deaths which occurred from puerperal infection in the Obstetrical Department of the Johns Hopkins Hospital during the past ten years. Lantern slide demonstration of the lesions observed.

This study indicates that the milder infections need little or no treatment, while the lesions noted in the severe cases indicate that whatever is done is usually futile, except in a relatively small number of cases which are susceptible to purely surgical treatment.

Puerperal Infections and Their Present Therapy.

Dr. John Osborn Polak, Professor of Obstetrics and Gynecology, Long Island College of Medicine, Brooklyn.

The routes of infection following birth injuries. Nature's defenses and attempts to arrest septic invasion with a consideration of the physiologic, pathologic and chemical processes which aid in this arrest. Prophylactic, medical and operative treatment of particular puerperal lesions.

TUESDAY EVENING, OCTOBER 28, 8:30

Bacteriophage as a Treatment in Acute Medical and Surgical Infections.

Dr. F. d'Herelle, Professor of Bacteriology, Yale University School of Medicine, New Haven.

¹ Program arranged by courtesy of the Section of Obstetrics and Gynecology.

Observation of the patients suffering from bacterial diseases shows that the recovery is the result of bacteriophagy *in vivo*, which is a very complex phenomenon. It is possible to provoke the phenomenon experimentally, and the latter method constitutes a cross experiment and also provides a general mode of treatment in medical and surgical bacterial infections.

Infections of the Skin and Subcutaneous Tissue—Including Infections of the Fingers and Hand.

Dr. Frank L. Meleney, Assistant Professor of Surgery, Columbia University.

Anatomical considerations. Bacteriological considerations. Vaccines and sera. Prophylactic measures, cleansing versus antiseptics. When to operate. Indications for emergency or immediate operations. When not to operate. The application of heat or cold. Postoperative treatment.

Acute Pulmonary Infections.

Dr. Rufus Cole, Director, Hospital, Rockefeller Institute.

It is important to attempt to classify acute pulmonary infections not only on an anatomical basis but on a clinical and etiologic basis as well. The old purely anatomical classification is of secondary significance for the clinician. Considerable progress has been made in differentiating the various kinds of pneumonia clinically and etiologically. The treatment of different kinds of pneumonia is discussed.

WEDNESDAY EVENING, OCTOBER 29, 8:30

Carpenter Lecture: Immunity—General and Local.

Dr. Hans Zinsser, Professor of Bacteriology and Immunology, Harvard University Medical School, Boston.

The physiological significance of the mechanism of immunity—natural and acquired immunity discussed—general and local factors which participate—relationship between the significant chemical constituents of the invading microorganism and cells in antibody formation—relationship between hypersusceptibility and immunity—types of immunity as represented by resistance against the various acute infections—some of the more chronic infections, like syphilis—filterable viruses and protozoa.

Serum Therapy.

Dr. William H. Park, Director of Laboratories, Department of Health.

Brief review of the nature of antitoxic and antibacterial serums. The therapeutic use of these serums in different diseases with the consideration of the methods of administration.

THURSDAY EVENING, OCTOBER 30, 8:30

Facts and Fancies Concerning Vaccines and Non-Specific Therapy.

Dr. Ernest E. Irons, Clinical Professor of Medicine, Rush Medical College, University of Chicago.

Rheumatic Fever.

Dr. Homer F. Swift, Member of the Rockefeller Institute for Medical Research.

The disease is considered from the standpoint of a chronic condition in which there are active episodes of varying intensity which are recognized as acute or subacute rheumatic fever. A form of the disease is also recognized as being almost continuously active. Factors which seem to be conducive to these various forms are discussed.

FRIDAY EVENING, OCTOBER 31, 8:30

Acute and Subacute Bacterial Endocarditis.

Dr. Emanuel Libman, Professor of Clinical Medicine, Columbia University.

Meningococcus Infections Including Meningitis.

Dr. W. W. Herrick, Visiting Physician, Presbyterian and Sloane Hospitals.

Consideration of the meningococcus and of the several clinical types of infection with this organism, with special emphasis upon diagnosis and treatment.

COMMITTEE ON MEDICAL EDUCATION

The Committee has recently published a revised "Synopsis of Approved Opportunities for Postgraduate Medical Study in the Clinical Specialties." The synopsis is in the form of a booklet 48 pages and lists courses and residencies which have been approved by the committee, in twelve clinical specialties as follows:

Dermatology and Syphilology

Internal Medicine

Neurology and Psychiatry

Obstetrics and Gynecology

Ophthalmology

Otolaryngology

Pediatrics

Roentgenology

Surgery

Orthopedic, Traumatic, Rehabilitation Surgery,
Physical Therapy

Urology

The committee has also published a revision of the booklet entitled "Opportunities for Postgraduate Medical Study Offered in New York City." In the new booklet there has been included considerable information that was not contained in previous editions, as its table of contents indicates. The booklet includes a map showing the location of important hospitals, a statement of the facilities which the Academy offers to visiting medical men, approved postgraduate courses, approved residencies in the clinical specialties, fellowships, non-operative clinics and conferences, clinical and pathological conferences and ward rounds. The body of the booklet is taken up with a statement of the special opportunities to observe clinical practice in the teaching hospitals of the city and includes the names of attending medical men and their days and hours of attendance. The booklet has been much used as a guide for visiting medical men, especially those whose stay in the city is limited. Over 1,500 copies have been distributed during the past year.

cyte counts in the capillary blood. This sudden and considerable diminution of the capillary leucocytes, unaccompanied by corresponding changes in the blood of the larger vessels, implied a corresponding accumulation of leucocytes in the viscera. Since the effect could be brought about by the intracutaneous injections not only of lactalbumen but of other non-irritating substances like distilled water, Müller concludes that the general effect is secondary to a reflex stimulated in the sympathetic nervous system. He believes that injections into the skin initiate, through the autonomic nervous system, a peripheral vaso-dilatation with corresponding vaso-constriction in the splanchnic areas, and that the alteration in leucocyte distribution depends upon forces secondary to the changes in the vascular walls. The dependence of alterations in leucocytic distribution upon vaso-motor conditions had previously been emphasized by physiologists—Garrey among others. By referring such reactions to impulses stimulated in the sympathetic nervous system, Müller makes it comprehensible how such entirely unrelated skin stimulations as hot packs, wet compresses, radio-therapy, Bier's therapy and massage can result in similar phenomena. We are of course not yet ready to accept Müller's results, since as far as we know they have not been experimentally confirmed.

Incidentally, these observations, together with related experience from the field of hypersensitiveness, strengthen a growing impression that we must look upon the skin as a special organ, with individual functions and reaction capacities considerably more far reaching than its mere significance as integument.

While we do not share the extreme views of Besredka¹ regarding the strict limitations of susceptibility and immunity in given diseases to specific tissues, available information indicates that, together with a systemic general immunity, there is often a relatively more intense immunization of those cell complexes that have been in direct conflict with the invaders. This is quite obvious in

and physiological occurrences are inter-related." To mention only a few of the significant things which follow upon the injection of—let us say—typhoid vaccine in moderate dose: There is a powerful reaction in the bone marrow, with temporary leucopenia followed by a considerable increase in circulating leucocytes; there is enhanced activity of the reticulo-endothelial system and an increase in blood platelets; there is temporary speeding up of metabolism, an increased concentration of blood enzymes, and an increase of fibrinogen and blood globulin; there is a profound change in the relative distribution of blood in the visceral and splanchnic areas, with consequent effect upon leucocyte distribution, and with the development of chills and fever, according to alternating peripheral or visceral vaso-constriction. Müller and Petersen made the significant observation in this connection, that the injection of either bacteria or peptone gave rise to reflex vaso-motor change in which there was a general vaso-constriction on the periphery and a simultaneous vaso-dilation of the splanchnic vessels. This may well explain the severe chills we have all noticed following accidental intravenous inoculation of typhoid vaccines, and it is not impossible that the accompanying reactions of cells and tissues may be secondary to this powerful vascular stimulation. It is reasonable to regard the general effects in these phenomena as analogous to a sort of systemic inflammatory reaction, in which there is a temporary increase of all the physiological activities, and among them an enhancement of the defensive mechanism.

In addition to the purely non-specific effects, such protein injections seem also to stimulate any existent latent specific capacities. Animals that have once been immunized and allowed to rest until antibodies have disappeared from the circulation, may again produce antibodies when injected with non-specific substances such as salt solution, nucleic acid, etc., and this is probably the basis of some of the successes reported in sub-acute and chronic conditions by such injections. This would explain, among other

things, the partially specific effects when the method is applied in the course of diseases such as typhoid fever at times when antibody formation is initiated but perhaps lagging.

III.

As a natural corollary to studies on methods of reinforcing natural resistance there has developed a growing interest in problems of host susceptibility. There are many infections to which man is so highly and uniformly susceptible that practically all previously uninfected individuals contract them if thoroughly exposed. Thus there are no significant differences in human susceptibility to measles, mumps, smallpox, influenza, cholera, plague and some other diseases, and the supposed greater susceptibility in childhood can be shown to be fictitious and attributable to the fact that exposure and consequent immunization is sure to have occurred before adolescence.

There is another class of diseases like the common cold and pneumonia in which the average resistance of the normal human being is relatively high and in which infection occurs, as a rule, in the train of predisposing diseases or of fatigue, exposure to sudden changes of surface temperature and other accidental depressing factors which let down the bars that ordinarily prevent penetration.

The fluctuations of normal susceptibility, however, which interest us most are those in which there seem to be distinct systemic differences in previously uninfected people which are not dependent merely upon resistance-depressing accidents.

Among these factors of difference the ones most actively discussed have been what Draper and others have spoken of as "constitutional types," and the influences which may be exerted upon susceptibility and resistance by nutrition, particularly as regards vitamin deficiencies.

The constitutional type concept is an interesting one,

cipherable scrawl reads: "Sum Heinrici Nollij qui me sibi comparavit Anno salutis 1607. 18. jan." i. e. "I am the property of Henricus Nollius who bought me for himself in the year of grace 1607, 18 January." It is amusing to think of the honorable statesman carefully, and perhaps surreptitiously while the bookseller's back was turned, removing a leaf or two from a perfectly respectable volume. On the recto of the fly leaf is carefully written: "Hic liber est aeternae philosophiae sapientiaeque fons aeternus. Liber Fones et Amicorum suorum." This inscription in the manner of Grolier was no doubt entered by Winthrop's uncle and father-in-law, Thomas Fones (or Ffownes, not Jones as he is referred to in at least two articles on Winthrop), an apothecary in London at the Sign of the Three Fawns in the old Bayley. His daughter, Martha, married Winthrop in 1631, two years after her father's death.

John Winthrop died in 1676. His books, at least a part of them, passed into the hands of his son, Wait Still, who though a jurist by profession devoted himself in his spare moments to the study of medicine. It is probable that the books went through several generations from father to son, from Wait Still to John, from John to John Still, and from the latter to Francis Bayard Winthrop. In the 1813 catalogue of the New York Hospital Library there is a list of books which "were presented by Francis B. Winthrop, Esq. and were part of the Library of John Winthrop, Esq. first Governor of Massachusetts." It is obvious that the reference to the first John Winthrop is erroneous. There are over two hundred titles mentioned, including a variety of subjects, such as "A Treatise for Declining Verbes, second chiefest Work of the French Tongue," "Spiritual Logick, Some Brief Hints and Helps to Faith," "Animadversions of Warre; or a Militarie Magazine of the Truest Rules and Ablest Instructions for the Managing of Warre," and "Art of Breeding Horses, and Art of Riding." Eight of these were published after Winthrop's death, but the others might well

have been a part of his collection. Curiously enough the eight books identified here as Winthrop copies are not included in this list, but appear among the "Addenda," in the 1811 catalogue of the same library, possibly an earlier gift of Francis Winthrop's. The latter had left the home which his ancestors had industriously worked to establish and had settled in New York City. Eighty-five years after his generous donation, The New York Hospital Library of 23,000 volumes was presented to the New York Academy of Medicine. It is more than likely that we have many other Winthrop items among these books. A glance at the New York Hospital copies of the titles in Francis Winthrop's list has not produced any which could be identified as such. Perhaps a more thorough search will bring others to light, and once again can be placed side by side the volumes of one of our earliest and best known libraries.

GERTRUDE L. ANNAN.

AMONG OUR MANUSCRIPTS

Old Remedies for Old Grievances

A medical treatise of the twentieth century often presents a vocabulary so replete with technical, scientific terms that it seems alarmingly unintelligible to the layman, yet a few centuries ago when it was no novelty to find "Every Man his own Physician," the compilations of medical remedies and cures prove simple enough reading for the least learned of us. Not very long ago there was purchased for the Library an English manuscript of the seventeenth century which contains 296 receipts for the relief of a variety of "grievances." The first leaf is unfortunately missing and there are no clues in any other part of the book which might lead to the discovery of the one who culled these from many sources and transcribed them for our interest and amusement.

Many are attributed to contemporary doctors, some to friends and relatives, but the largest part have evidently come from unknown origins. Of this last group the writer occasionally signifies his faith in them by "probatum est," or calls the remedy an "Excellent Balme," an "Infallible Cure," or an "Approved Receipt that seldom or never fails." Among these are titles which bring to mind specimens of modern advertising, such as, "Dr. Dike's Diet Drinks," "This will cure a bruise be it ever so black," "A receipt for the eies which cost my Lord Gorge [*sic*] for obtaininge it one hundred pounds," and "Golden Treat that healeth all Bruises." He tells how to make "Aunt Boul't's Salve," "My cousin Martin's Black Salve" and "My father Mallack's receipt against the Stone." Cousin Martha's salve consists of "sallet oyle," lead, rosin and wax, which when "boyled," by "trying some dropps of it upon a Saucer you will see then it will roule." Father Mallack's receipt is very simple, "take a sheet of writing paper & prick it full of holes with a pin then take a dish and strew some grosse pepper on it, then take one handful hay maidens & a handfull of wormwood and a handfull of green broom, put all these into a dish with hott embers and apply to the navill. You must apply the paper first. Probat: est."

Dr. Thomas Sydenham, so important in the history of medicine, is here represented by his "Purgeing Potion," which consists of "Thamarind one half an ounce; Leaves of Sena one Dram and Halfe; Rhubarb cut four Scruples. Let these boile in a sufficient quantity of water and straine theme three ounces. Dissolve into it one ounce of manna and three Dramms of Loosening Syropp; of Roses; mingle these & take them fastinge. rest one day & take one dose more."

Dr. Daubeney Turberville, who acquired considerable fame in that century as a specialist of diseases of the eye, is held responsible for the following "Receipt to comfort the eyes." "Take 3 spoonfulls of virgin honey well clarified; two of Red fennell water, Two of white rose water,

mixe these together & keepe it in A glasse; and drop it with A feather often into the eye."

There are three receipts attributed to Dr. Robert Vilvain, philanthropist of the seventeenth century, who practiced in Exeter. The most interesting of these is his "Rare Receipt to cure the Spleen. Take of your Smooth Holly: and take of the Leaves a good quantity. & dry them in an oven after a batch of bread is drawn. Then pound and sift them to a powder: Take this powder for a moneth together in a Spoonful of beer or sack, as much as will Lye on a shillinge at a time."

Sir John Hinton, physician to the family of Charles II, was perhaps better known for his exploits as a royalist than for his achievements as a practitioner in midwifery. In this collection are receipts for an "Emulsion," "Lozenges," a "Julip," and a "Plaister," which Dr. Hinton is thought to have administered to a patient at childbirth. For the "Julip," "Take Plantine water, strawberry water of each three ounces; the small sort of Cynamon water, of water Hyster; each halfe an ounce; syrop of Corall one ounce. mingle them and make a Julip; take two or three spoonfulls after the birth if in case of immoderate Alvinum & sanguinis."

Sympathy Powder has always been associated with Sir Kenelm Digby who claimed that he learned how to make it from a Carmelite, who had spent much of his time in the East. Digby came across him in Florence in 1622 and the good father divulged the secret to him. Although we have "Sir Kenelm Digby's receipt for a fistula," the following method of making Sympathy Powder is not ascribed to him. "Take of blew vitrioll stone two ounces, add a quart of water and stir them with a knife, & if it be right, it will make the knife black. Take a Linnen cloth dipt in the blood of the wound & wash it out in the water. Let the water stand in a temperate air, untill the party be well." For "Double Powder of Sympathy" take "oyle of Roman Vitrioll & dry it in the sun in march till it bee Powdered; and soe keepe it and apply it to anythinge that hath the

blood of the wound: neither must it be dryed in the Dog days."

Of American interest is "The Receipt of the green oyntment Sir Ferdinando Gorges way," for no doubt he introduced it into the province of Maine, the colony which for years he fostered and encouraged. This ointment "helpeth aches, bruises, Palsies, Gouts, shrinking of sinews, sciaticks, aches of the back, Lameness, Plurisies, the Collick, the Spleen, the cold, Dropsy of the liver, . . . the cough, the soles of the feet being anointed therewith, & extream pain of the head, . . . scaldings & burnings, the places being hurt, anointed with it 2 or 3 times a day with a feather, for it will take out the fire & cure the hurt . . . alwaies keeping a Linnen cloth thereon, dipped in the same oyntment."

Many of the remedies are indeed wonderful. A roasted "fatt catt" will cure an ache in the shoulder. For the Gout, "Take the Maw of an oxe or Bullock: in May or June; as soone as it is out of the oxe, cut a little hole as much as you may slip your foot into it & Let it be in it till it be almost cold." "My Lord, Gorge, [*sic*]" is held responsible for "A Rare Medicine for the help of a consumption and to make a Lean body Fatt. Take a Swine of a year old and kill him and save the blood; and distill that blood in a glasse still and drinke of that water morneinge and eveninge sweetened with a Little Sugar." If Thomas Parr, whose death occurred in 1635 at the age of 152, and Henry Jenkins, who died in 1670, claiming to be 169, might be considered as indications of the efficacy of the remedies of the time, no doubt some of these cures were as the writer informs us "excellent good" and "experimented by thousands."

GERTRUDE L. ANNAN.

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DEATH NOTICE

JOHN EDWIN STILLWELL, M.D., 32 West 52 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1875; elected a Fellow of the Academy May 7, 1896, died, October 6, 1930. Dr. Stillwell was a Fellow of the American Medical Association and a member of the Society of Alumni of Bellevue Hospital.

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The Wesley M. Carpenter Lecture IMMUNITY—GENERAL AND LOCAL

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I.

It is not my intention to recapitulate the fundamental facts of immunology, nor to discuss theories of mechanism. This would be mere repetition of conventional formulas with which you are familiar. Clinicians have begun to apply the reasoning technique of the laboratory to the study of therapy of infectious diseases. When, therefore, a specialist is permitted to discuss his subject before the physicians are interested in knowing whether the trend of his subject is leading and in which directions it promises to progress beyond the understanding already attained.

Like other branches of knowledge, immunology has had its alternating periods of rapid advance and apparent stagnation. Ten years ago there seemed to be such a slowing down during which the discoveries of the pioneers were being consolidated and practically applied. During the last ten or fifteen years we seem to have broken into open country and the hounds are in full cry again; many of them, no doubt, on the wrong scent, but in other cases there is promise of fundamental change in immunological conceptions and practice. It is naturally impossible to do

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more than select, from a wealth of material, a few topics which appear to have particular bearing on clinical medicine, and into which my own work has led me.

Immunity in its broad connotation is the study of reactions of animal and plant tissues to foreign materials which can neither be utilized for nutrition nor excreted without alteration. It is obvious that the types of cellular and humoral responses, therefore, will be of many kinds, according to whether the foreign substances are soluble or insoluble, inert or toxic, dead or living. Between the giant cell formation occurring about cotton fibres or steel splinters, the cellular accumulations about tubercle bacilli or treponemata, or the complex structure of staphylococcus abscesses there are profound differences, but they are all expressions of a fundamental mechanism which protects the integrity of the tissues.

The various responses which are initiated by the entrance of foreign materials constitute inflammation, and this term—though usually applied to the local reactions—should be physiologically extended to include the deeper consequences which take place in remote regions of the body, influencing the distribution of leucocytes and perhaps the activities of other cells in distant parts. Conceived in this way, inflammation is the expression of natural immunity by which all animals and plants, not previously invaded, defensively respond.

The forces of natural resistance are normal reactions, a physiological emergency apparatus, called into play when foreign materials enter the tissues. When the invading substance, as in the cases of the cotton fibre, the steel splinter, or inhaled dust, is non-antigenic, the reaction accomplishes its purpose and the mechanism returns to normal quiescence essentially unchanged to future stimuli. With the so-called "antigenic" materials, however, repeated or prolonged contact leads to specific enhancement of the defensive reaction. And analysis of these increased defenses constitutes our knowledge of artificial immunity.

The fundamental fact of immunology is the existence of antigenic materials. The term signifies that this class of substances, once in contact with the tissues, arouses responses which specifically modify subsequent reactions. The antigens are all proteins and the antigenic property and its specificity are closely related to chemical structure. All native proteins which are amenable to enzyme action—that is, neither denaturized nor racemized—are antigenic. And infectious disease, on this basis, is nothing more than the presence in the body of a living and multiplying antigen which is sometimes extraordinarily insoluble, is often toxic and may frequently possess selective invasive power for special organs or tissues. The nature of the clinical disease is dependent upon the habitual portal of entry, upon the tendency for general or selective invasion, and upon the specific pharmacological action of poisons that may be produced. The nature of local lesions, also, may vary according to the solubility and the chemical constitution of the microorganism.

The chief difference, then, between natural immunity and acquired immunity to infectious disease is that which results from the antigenic properties of the bacteria and their poisons. The most obviously determinable factor in this difference is that of antibody production. And when we compare the reactions of a normal animal with those of a recently immunized one, the decisive differences between them are largely those dependent upon the activities of the circulating antibodies either in the prompt neutralization of toxins or in the accelerated destruction of the bacteria themselves. But antibody production is after all, only the expression of underlying cellular activities and immunity may persist after antibodies have disappeared. There remains in the immunized animal a specifically increased power to react with the responsible antigen. This expresses itself as hypersensitiveness which, with the non-bacterial antigens, may be entirely harmful. But hypersensitiveness to the bacterial antigens may, in some of its aspects, represent an acceleration of the local inflam-

matory reaction and, in this sense, possess defensive functions. Moreover, the increased specific reaction capacity is also expressed by an acceleration of antibody production. Whether, in addition to this, there is an occasional increase of local resistance to injury by the cells at the habitual portal of entry, as believed by Besredka, is not yet determined.

In regard to the mechanism of specific antibody production, we are quite as much in the dark as we have ever been. But there is a tendency in immunology to-day to question classical formulas like the side chain theory and to return to the original conceptions which favored the incorporation of some of the antigenic constituents in the antibody. Such a view takes its clue particularly from the fact that proteins which have become resistant to enzyme action are no longer capable of antibody formation, a condition which implies the necessity for at least a partial, probably cellular, digestion of the antigen in the course of the generation of the antibody.

Such problems, however, though of great fundamental importance, are as yet far removed from clinical interest. There are other phases of modern immunological investigation which have more direct bearing on clinical theory and practice. It is some of these that I wish to submit to you.

II.

Among the most interesting of these developments is that dealing with the non-specific enhancement of the natural defenses.

Natural resistance depends upon the coöperation of a number of different forces. Among these are the bactericidal powers of the blood plasma in which the alexin of Buchner is especially concerned but in which heat-stable bactericidal substances, less thoroughly studied, play an important rôle. Normal plasma also contains opsonic substances which lead to active phagocytosis by polymor-

phonuclear leucocytes. These forces are the ones most easily studied, but they are no more important, and perhaps subsidiary to the defensive activities of cells of the reticulo-endothelial system.

This system of cells, as defined by Aschoff, comprises cells widely distributed in the body, of probably similar physiological function, and recognizable, among other things, by their ability to take up intravital dyes. It includes the endothelial lining of blood and lymph capillaries, connective tissue elements, and particularly endothelium of the spleen, the lymph nodes, the liver capillaries, together with the mobile histiocytes, clasmatocytes and monocytes. One of the first to attribute protective functions to cells of this system was Kyes, who demonstrated the destruction of pneumococci by the Kupffer cells of the liver and the reticular cells of the spleen in naturally immune pigeons. Berry and Melick showed, later, that pneumococci are collected within these organs in a few hours and destroyed within a day. Especially convincing of the protective functions of the large mononuclear cells of this system are the investigations of Gay and his collaborators with streptococcus infections in rabbits.

Attempts to show parallelism between each of the protective forces mentioned and natural immunity have been numerous, but it is likely that all of them are active together and that with different infections in various animals the preponderance of one or the other process is specifically characteristic of the given case.

For purposes of discussing methods of enhancing natural resistance it is best to consider separately local natural resistance and systemic resistance.

Renewed interest in local resistance, both natural and acquired, has been revived by the work of Besredka. He believes that in various infections there is considerable difference in the susceptibilities of individual tissues. Thus, anthrax infection takes place easily in the skin, but, he asserts, if the organisms can be brought into the body

without injury to the skin, considerable numbers may be introduced without harm. In a similar way the bacilli of the enteric diseases and of cholera are conceived as having specific virulence for the intestinal mucosa. Besredka believes that it is sufficient in each particular case to immunize only the susceptible tissues and thereby prevent infection. From these considerations developed his methods of local immunization of the skin in anthrax and his vaccinations by mouth in typhoid, dysentery and cholera. The theory which he has built upon his experiments is a complicated one and will not be reviewed because we believe it to be untenable. On the other hand, some of his experiments, though in our opinion erroneously interpreted, have led to an understanding of many empirical methods for the treatment of local infections and have encouraged the development of new procedures for this purpose. In cutaneous infections with staphylococci and streptococci he found that prophylactic and some therapeutic effects could be achieved by compresses and injections of broth culture filtrates of the organisms causing the infections. His observations regarding the protective effects of broth compresses and injections have been corroborated by Gay and Morrison, by Rivers and Tillet and, in our own laboratory, by Mallory and Marble, but it has been found by these investigators that broth uninoculated with the organisms is quite as effective as are the specific preparations. Gay and his collaborators, who have analyzed these conditions with streptococcus infections in rabbits, have demonstrated that injections of broth into the pleura lead, within seventy-two hours, to a massive accumulation of clasmatoocytes, and that at this period there is a considerably enhanced local resistance. Indeed, Gay has further shown that after an accumulation of macrophages has been stimulated in one area, the cells may be re-mobilized in adjoining areas by further broth injection or by infection.

If so simple a substance as a broth filtrate will produce a reaction that enhances the chemotactic accumulation of

protective cells, it would be surprising if this could not be brought about by many other stimuli, and—indeed—we seem here to have an experimental explanation for the non-specific empirical methods of the wet dressing, the compress, the poultice and numerous local effects which have hitherto been mysterious. Moreover, it is not impossible that the mechanism by which broth acts may be similar to that which is involved in massage, in the application of heat, and in the influence of light radiations. Cramer, who has studied the effects of X-rays, regards radio-therapy as in part a stimulation of the reticulo-endothelial tissues, and correlates the effects of such treatment with other non-specific agencies that can increase natural resistance. Obviously, in these simple and, in some cases time-worn procedures of minor surgery, we have methods which accelerate the inflammatory protective mechanism which is set in motion by the infection itself—but perhaps with insufficient vigour and possibly is slowed down by coincident toxic injury.

It is of course difficult to come to any conclusions about this unless we can learn more of the forces which induce local inflammatory changes and cellular accumulations. This subject is obscure, but a plausible point of view has been brought forward by E. F. Müller. Müller's point of departure was an observation made in the course of the non-specific therapy of chronic urethritis. In such cases it was observed that intramuscular injections of 10 or more c.c. of lactalbumen, an entirely non-irritating substance, was followed within three to five hours by noticeable aggravation of the chronic inflammation, followed by an increase of secretion and the appearance of living leucocytes in the exudate. While amounts of more than 7 c.c. of the lactalbumen were necessary to produce this effect intramuscularly, the same result could be achieved with amounts as low as 0.1 to 0.2 c.c. injected intracutaneously. Müller found that within a short time after the injections there was a determinable change in the distribution of leucocytes, the immediate effect being a sharp drop of the leuco-

and physiological occurrences are inter-related." To mention only a few of the significant things which follow upon the injection of—let us say—typhoid vaccine in moderate dose: There is a powerful reaction in the bone marrow, with temporary leucopenia followed by a considerable increase in circulating leucocytes; there is enhanced activity of the reticulo-endothelial system and an increase in blood platelets; there is temporary speeding up of metabolism, an increased concentration of blood enzymes, and an increase of fibrinogen and blood globulin; there is a profound change in the relative distribution of blood in the visceral and splanchnic areas, with consequent effect upon leucocyte distribution, and with the development of chills and fever, according to alternating peripheral or visceral vaso-constriction. Müller and Petersen made the significant observation in this connection, that the injection of either bacteria or peptone gave rise to reflex vaso-motor change in which there was a general vaso-constriction on the periphery and a simultaneous vaso-dilation of the splanchnic vessels. This may well explain the severe chills we have all noticed following accidental intravenous inoculation of typhoid vaccines, and it is not impossible that the accompanying reactions of cells and tissues may be secondary to this powerful vascular stimulation. It is reasonable to regard the general effects in these phenomena as analogous to a sort of systemic inflammatory reaction, in which there is a temporary increase of all the physiological activities, and among them an enhancement of the defensive mechanism.

In addition to the purely non-specific effects, such protein injections seem also to stimulate any existent latent specific capacities. Animals that have once been immunized and allowed to rest until antibodies have disappeared from the circulation, may again produce antibodies when injected with non-specific substances such as salt solution, nucleic acid, etc., and this is probably the basis of some of the successes reported in sub-acute and chronic conditions by such injections. This would explain, among other

things, the partially specific effects when the method is applied in the course of diseases such as typhoid fever at times when antibody formation is initiated but perhaps lagging.

III.

As a natural corollary to studies on methods of reënforcing natural resistance there has developed a growing interest in problems of host susceptibility. There are many infections to which man is so highly and uniformly susceptible that practically all previously uninfected individuals contract them if thoroughly exposed. Thus there are no significant differences in human susceptibility to measles, mumps, smallpox, influenza, cholera, plague and some other diseases, and the supposedly greater susceptibility in childhood can be shown to be fictitious and attributable to the fact that exposure and consequent immunization is sure to have occurred before adolescence.

There is another class of diseases like the common cold and pneumonia in which the average resistance of the normal human being is relatively high and in which infection occurs, as a rule, in the train of predisposing diseases or of fatigue, exposure to sudden changes of surface temperature and other accidental depressing factors which let down the bars that ordinarily prevent penetration.

The fluctuations of normal susceptibility, however, which interest us most are those in which there seem to be distinct systemic differences in previously uninfected people which are not dependent merely upon resistance-depressing accidents.

Among these factors of difference the ones most actively discussed have been what Draper and others have spoken of as "constitutional types," and the influences which may be exerted upon susceptibility and resistance by nutrition, particularly as regards vitamin deficiencies.

The constitutional type concept is an interesting one,

but extraordinarily difficult of experimental approach. The nutritional factors are more easily studied.

The disease in connection with which this type of relationship has been most considered is tuberculosis, in which it is well known that nutritional disturbances predispose, whether they are due to faulty diet and digestive difficulty, or to the nutritional consequences of debilitating acute or chronic disease. There has been much evidence in the post-war increase of tuberculosis in certain European countries which has suggested direct relationship between the incidence of tuberculosis and fat deficiency. The time-honoured use of cod liver oil may depend upon its fats—or more probably upon its vitamins—but there seems to be little doubt of its actual beneficial influence. In spite of this, we have little conclusive experimental evidence which would give the conception greater precision, except perhaps the experiments of Lange and Simmonds, which seem to show that rats fed on high fat diets, although deficient in vitamins threw off moderate tubercular infections with greater ease than did the controls.

The suggestion of dietetic relationship to susceptibility is not a recent one. Theobald Smith in 1913 attributed a stable epidemic among guinea pigs to a lack of green feed. The vitamin idea was not drawn into the discussion until later, and is beginning to accumulate a considerable literature, which is suggestive, though not yet conclusive. A number of investigators—Coulaud, Schilf and others—have obtained results differing from those of Lange in that they attribute a hastening of death in guinea pigs from tuberculosis to a lack of vitamin C. Gloyne and Page, who studied tuberculosis in rats fed on a vitamin A-free diet, found that the animals died before the controls from an intercurrent pneumococcus infection, rather than from tuberculosis, and in many similar experiments of other investigators this same increased susceptibility to secondary infection has been noticed.

A number of studies have dealt with the predisposing in-

fluence of scurvy. Abel's article of 1924 emphasized the importance of the early stages of scurvy during which, without marked scorbutic symptoms, increased susceptibility to a number of different infections—including such dissimilar things as influenza, tuberculosis and vaccinia—was noticed.

The most important investigations dealing with this question are those in which susceptibility to spontaneous infections in animals were studied, since in such delicate balances as the ones involved, experimental infection represents too severe a test for slight differences. For this reason, there is particular weight in the experiments of Webster and his associates, who observed greater resistance on the part of mice fed on McCollum's diet, both against mouse typhoid and against botulismus toxin. Similar to this work are the experiments made in 1928 by Schmidt-Weyland and Koltzsch. Taking advantage of the frequent epidemic respiratory infections occurring in guinea pigs, they attempted to infect animals through the respiratory passages with sprays of broth cultures of pneumococci and of chicken cholera bacilli. Other animals they infected with the same material by feeding. Comparing the results obtained in normally fed animals with those in animals subjected to scorbutic diets, they not only determined a much higher susceptibility to intentional infection among those suffering from scurvy, but obtained in these animals a much higher percentage of accidental infections.

That nutritional disorder predisposes to infection seems likely, therefore, from clinical and experimental data. But it has not been easy to attribute such change to any specific vitamin factor. Regarding the effect of vitamin A, most of the work that was reported until recently has been contradictory. An exceptionally clean-cut result, pointing to the importance of vitamin A, is the recent study of Green and Mellanby, who found that rats fed on diets deficient in vitamin A developed marked susceptibility to pyrogenic infections not noticed in control rats. Prompt feeding of vitamin A often resulted in cure, with disap-

pearance of the infection. Other studies that seem fairly consistent appear to attribute considerable importance to vitamin B. Thus Werkman found that rats suffering from lack of vitamin A or B become more susceptible than the normal to anthrax, and that pigeons fed on a low B diet become susceptible not only to anthrax but to pneumococcus. Similar observations were made on pigeons with low vitamin B diets by Findlay, who further determined that such pigeons become susceptible to Gram negative micrococci to which they are normally entirely resistant.

It is apparent from this brief account that the subject is still in much confusion. Nevertheless, enough has been done to attract the immunologist to the study of nutritional conditions, especially in efforts to explain the quite remarkable irregularities with which some infectious diseases—either sporadic or epidemic—select certain individuals of a group who present no obvious differences from others equally exposed.

Irregularity in susceptibility is particularly marked in some of the diseases caused by neurotropic ultra-microscopic viruses. We are referring particularly to infantile paralysis and the various forms of encephalitis. In poliomyelitis the matter has given much cause for thought to a number of investigators, and it is particularly Draper and Aycock who have expressed the view that the disease has a tendency to occur in individuals of certain constitutional types, and Aycock has tentatively endeavoured to correlate this with what he calls 'an "imbalance" of growth and metabolism due to increased or insufficient activities of the internal secretions, possibly influenced by seasonal fluctuation.

Our own interest in the matter was chiefly derived from a continued study of herpes encephalitis. Febrile herpes, the common cold sore, is obviously secondary to some direct or indirect tissue injury initiated either by irritating secretions, sunburn, etc., or systemically by certain febrile diseases, and even by vaccine injections. The virus derived from herpetic vesicles can produce in rabbits, guinea pigs, rats and certain species of monkeys an en-

cephalitis which has certain clinical and epidemiological similarities to encephalitis in man. It is a striking fact that certain forms of encephalitis in man are secondary to predisposing diseases, the most important among which are influenza, measles, chicken pox, smallpox and vaccinia. And since of the many who suffer from the predisposing diseases a few only develop encephalitis, the conclusion is inevitable that an individual susceptibility factor is involved.

We do not agree with Levaditi that there is adequate evidence to prove that herpes virus is the cause of human encephalitis. In his later papers no new facts are brought forward to reënforce earlier opinions. We are not even sure that all forms of encephalitis are infectious rather than toxic, but the similarity of encephalitic lesions with those of truly infectious conditions and the fact that most of the diseases that predispose are filterable virus infections inclines us to hold the view also expressed by McIntosh and others, that many filterable agents may become neurotropic when the unknown susceptibility factor exists. Herpes virus is an excellent material with which to study these relations for, as we have found, both in Cebus monkeys and in rats there is a natural difference in individual susceptibilities analogous to that in man. In Cebus monkeys we have been able to produce practically all the clinical varieties of encephalitis that occur in man, from the acutely fatal to the chronic, and some of the animals appeared to be entirely immune. Efforts to correlate this with nutritional conditions have not been conclusive, because in animals with extreme malnutrition it is difficult to differentiate between the neurotropic effects of the diet and minor lesions of encephalitis. In several series of rats a vitamin-free diet increased susceptibility from an average of 55 per cent to one between 90 per cent and 100 per cent, but here again it was necessary to carry the dietetic injury to such extreme degrees that no significant conclusions could be drawn. Further experimentation along these lines, however, is being continued.

In our studies with typhus fever, a disease which is notoriously tempestuous in times of famine, we have found that guinea pigs and rats in the late stages of scorbutic diet effects react much more severely than do normal animals, and in the rats there is a considerably greater than normal accumulation and distribution of the *Rickettsia* organisms which we feel confident are the causative agents of the disease.

Though the influence of diet and vitamin deficiencies offers for the moment an experimental approach more accessible than that of the constitutional difference, it may well be that dietetic deficiencies like debilitating disease or preceding toxic injury should be regarded merely as indirect influences bearing upon physiological activities of another kind. I have presented the subject in the full knowledge that it is still quite vague and speculative, but with the purpose of illustrating directions of thought in immunology which are of the greatest importance and to which experimental groping of the kind outlined is the only procedure which can eventually bring enlightenment.

IV.

No investigations have had a more far-reaching effect upon immunology than those dealing with bacterial dissociation. Much that was mysterious in the past regarding differences in antibody production when animals were immunized with non-virulent, heated or otherwise altered bacteria, has become clear. It has been shown that bacteria may assume a number of mutation forms visibly demonstrable by morphological alteration or by changes in manner of growth. What is most important, however, is the fact that with such obvious changes there is correlated a fundamental biological one which affects both virulence and the structure of the antigen.

Arkwright, who was one of the pioneers of the modern development of this subject, applied the words "rough" and "smooth" to the two types of organisms obtained from both

dysentery and typhoid cultures, because of the appearance of their respective colonies on agar plates. The dissociation of several mutation types has since then been accomplished with a majority of the pathogenic organisms, and it has been found that in most cases "smoothness" or the "S" type is associated with virulence, and "roughness" or the "R" form with relative loss of virulence. Dissociation is not limited to two types only, there may be intermediate stages between the completely virulent and the relatively harmless forms, and there are, in the motile organisms, where the flagellar substance forms a separate antigenic complex, four types—as studied by Li in hog cholera and by Grinnell in typhoid—motile rough, motile smooth, non-motile rough and non-motile smooth forms.

The antigenic modifications which accompany the morphological changes have profound bearing on clinical immunology. We may summarize them by stating that, in the non-motile groups like the streptococcus, pneumococcus, and possibly meningococcus and other organisms, the chief difference between a fully virulent and a so-called "rough" organism consists in the fact that the smooth or virulent contains the complete antigen in which there are, loosely combined, at least two substances—a nucleoprotein fraction and a carbohydrate material. Animals and man immunized with such "complete" bacterial antigens react with production of type specific antibodies. The carbohydrate material which carries the specificity is a haptene in Landsteiner's sense: it can combine with formed antibody, but cannot—dissociated from its protein fraction—induce antibody formation. This substance, which we identify roughly with the capsular or ectoplasmic material, is easily dissociated from its protein mate, is free in exudates or circulation, and by uniting with antibody and diverting it from the organisms interferes with bacterial destruction, thus contributing to the virulence of the bacteria, perhaps representing the so-called "aggressin" substance of Bail.

Since it is only the combination of the antigenic frac-

tions which can lead to the type specific antibody formation, the rough organisms—which contain only the protein constituents—though also antigenic, produce antibodies which are not type specific, but have in most organisms—certain streptococci excepted—a wider group specificity. It is the generally held opinion that these nucleoprotein antibodies have no particular protective significance. It is our own belief that the nucleoprotein antigen is related to allergic reactions and has in this sense an important pathological and immunological bearing. This, however, is neither fully determined, nor is it pertinent to the present discussion.

In the motile organisms such as the typhoid and paratyphoid groups, the complete antigen of the organism is represented not only by the two factors—protein and carbohydrate—mentioned but, in addition to these, by another antigen, complete in itself and functionally separate, which is present in the flagellar substance.

In toxin-forming bacteria like the diphtheria bacillus, roughness and smoothness expresses itself in capacity for toxin production, the toxin produced by the smooth types representing a separate antigen, not produced in cultures of the rough mutation forms.

It is obvious that these studies must profoundly influence clinical problems of vaccine treatment and serum production. Much of the older literature on different methods of growing organisms, different degrees of heat, or different kinds of chemicals to be used in vaccine production has become obsolete. We can now lay down briefly the necessary criteria for the preparation of the specifically effective vaccine. In view of the knowledge that most pathogenic species contain a number of serologically heterologous types, the original organism must be one homologous with that causing the condition to be protected against or to be treated. The organism used must be of the smooth, virulent variety, containing the whole antigen and all the antigenic constituents possessed by the

mutation form which causes the disease. It would be valueless to make a vaccine from a rough culture, and experiments of Li and the recent ones of Grinnell are showing that vaccines of the typhoid-paratyphoid groups are fully potent only when produced with the smooth organisms. In addition to the choice of organism, conditions and time of cultivation and further manipulation must be such that the effective antigen which gives rise to the preponderating protective antibodies is neither altered nor destroyed. Therefore, autolysis must be prevented, a condition which limits the choice of chemicals; also heating during sterilization may produce modifications. It appears from Grinnell's yet unpublished studies that even moderate degrees of heat may modify typhoid antigen, and, ordinarily, heat-killed typhoid suspension is considerably less potent in antibody production than a formalinized antigen. The antigenic effectiveness of formalinized bacteria has been reported by others and has been determined by us with pneumococcus vaccines; and in formalinizing capsulated anthrax bacilli we have found that complete morphology can be preserved by this method during many weeks of preservation. Formalinization requires more study in connection with vaccines for human use, and better methods may be evolved. In this place we wish merely to emphasize the criteria of vaccine production, which can now be simply formulated on the basis of mutation studies.

In regard to antitoxin production, the studies of our pupil Ho Yü, corroborating and extending those of other workers, confirm the necessity for periodical plating and renewed selection of smooth, toxin-forming organisms in order to keep toxin potency up to standard.

It is easy to modify a virulent S organism into the R form. This often occurs spontaneously in the course of cultivation on artificial media, and is an accompaniment of developing saprophytism. The process can be hastened by cultivation in bile broth, or in dilutions of inactivated homologous serum. This has epidemiological importance.

It has been shown that R pneumococci may appear in patients recovering from pneumonia, and our student Ho Yü has demonstrated that in convalescence from diphtheria R forms gradually increase in number in the throat, a process by which the carrier of virulent bacilli is often converted into a carrier of non-toxin-forming organisms. Since the R forms can be produced by cultivating toxin-forming S forms in antibacterial diphtheria serum, but not in anti-toxic serum, this implies a possible solution for the difficult problem of the chronic diphtheria carrier, suggesting immunization of such individuals with vaccines made of dead, smooth, diphtheria suspensions. For it is quite possible that because of the purely local and superficial situation of the diphtheria bacilli, there is an insufficient absorption of the unchanged S bacterial protein to stimulate the natural formation of adequate amounts of the antibacterial antibodies.

The possible transformation in the body of S into R forms may therefore be significant in explaining the hitherto obscure fact that in many epidemics—meningitis, the pneumonias, typhus fever and some other diseases—the mortality and the speed of numerical case incidence go hand in hand. Not only do morbidity and mortality often show a parallel rise, but after the peak—when cases are relatively few—the mortality is also lower. A reasonable explanation for this might be that while transmission is relatively rapid in a large reservoir of susceptibles there is rapid transfer of virulent S forms from early cases to new victims; whereas toward the end of an epidemic, with fewer susceptibles, the average transfer to the new victim is at a much later stage of the disease, when virulence (S forms) has been diminished by longer contact with the body of the partially convalescent.

No less important for medicine and epidemiology is the observation that under special conditions a reverse conversion from R into S forms may be brought about. Levinthal and Dawson have shown that R forms may revert completely to the original virulence and specificity; and Grif-

fifth has succeeded, by injecting mice with R forms of one type, together with considerable amounts of heated S culture of another type, in producing a transformation of a rough of the original type into an S of the type corresponding to that from which the heated S material was derived. Reimann has confirmed this, and Dawson has further succeeded in producing such conversion of one type into another in vitro. When he inoculated a type II R culture into tubes containing type III S substance together with blood broth and 10 per cent of anti-R serum, his R organisms were converted into type III S. This conversion from one type S into another type S never takes place directly, but only through the R mutant of the original type. The practical consequence of such transformation of non-virulent into virulent forms, even without type alteration, is obviously of great possible importance in connection with the sudden sporadic occurrence of disease, and with the often mysterious origin of epidemics. It is especially significant in connection with influenza and cholera epidemics, perhaps explaining the unexpected development of outbreaks in regions where there had been no obvious pre-existing focus.

V.

In a sense, immunology is beginning over again. The principles that govern resistance to bacterial infection in general are applicable to a limited degree only in tuberculosis and syphilis, and are still less so in the protozoan diseases and infections caused by ultra-microscopic filterable agents. Each of these constitutes a special chapter which must be separately considered. We wish merely to point out that one of the developments of modern immunology is the recognition of a number of variants of the defensive mechanism about which we cannot generalize from our knowledge of immunity in the bacterial diseases.

The special case which we wish to discuss in some detail is that of the ultra-microscopic or filterable virus diseases,

because of our own interest in these problems, and because of the importance of these diseases in clinical practice.

In practically all of the conditions caused by filterable agents, an attack is followed by an immunity which—if not permanent—at any rate lasts for a number of years. Analysis of the circumstances attending such acquired resistance reveals a number of outstanding facts which differentiate this type of immunity from other types.

Important among these is the observation that active immunization can not be achieved with killed virus. For the establishment of resistance it seems necessary that the cells react with the living agent. Evidence based upon the presence of inclusion bodies and the virulent nature of washed cells of infective tissue indicate that the virus must enter the cell to cause disease. And if this is correct, it would explain why immunization can be attained only under conditions which permit such penetration. Acceptance of this principle would restrict our prospects of prophylactic vaccination in diseases like poliomyelitis, etc., to the discovery of methods of safe attenuation comparable to Jennerian vaccination in smallpox.

There are two apparent exceptions to the necessity of using living virus for prophylactic purposes. One is the Semple method of rabies prophylaxis with phenolized virus; the other, the formalin distemper immunization of Dunkin and Laidlaw. The exceptional character of these observations, and the necessity for delicate adjustment of the formalinization in the distemper experiments justifies some doubt whether the materials in these cases are killed rather than profoundly attenuated. Yet the observations imply practical consequences of such importance that they cannot be ignored. And it is possible that a sufficiently massive immunization with dead virus might give results. In another type of disease—Rocky Mountain spotted fever and the typhus group—in which similar conditions exist, encouraging results are being obtained with carbolized and

with formalinized virus, provided sufficient concentrations of the infectious agent can be obtained in the vaccine.

Examination of the conditions which determine immunity in a convalescent or in an animal immunized with a living agent has revealed that the serum contains substances which neutralize the virus *in vitro*. Incubation of the agent with such serum before injection often renders the virus innocuous, though in certain experiments of Andrewes with virus III and with vaccinia this was reliable only with skin injections and incompletely so when injections were made into brain or testis. In our own observations with herpes virus, neutralization *in vitro* was successful, but no passive immunization could be accomplished when the serum was introduced separately from the virus, even when serum preceded inoculation.

The protective serum body is not an antibody in the usual sense. It persists in the blood of convalescents for years, and it cannot be increased by hyper-immunization to anything like the extent that this can be done with bacterial antibodies. The manner of action of the protective bodies has been considerably elucidated by tissue culture carried out by the Maitland method. Andrewes found, with virus III and vaccinia, that if tissue and immune serum are mixed and then inoculated with virus, the agent does not multiply, and no inclusion bodies are formed. But if virus and tissue are brought together for only a short time, and then immune serum is added, the virus survives, and inclusion bodies form—even if the tissue has come from an immune animal. The experiments of Rivers are similar, except that he found a certain degree of independent resistance on the part of the immune tissues. Both of these observers were able to show that even in supposedly neutralized mixtures, the virus is neither killed nor firmly united, but can be recovered in virulent form.

These observations, as Andrewes points out, indicate that the protective bodies probably act merely in preventing the virus from entering the cells, but are not able to

affect the virus after it has become intracellular. Immunity therefore depends upon the preliminary presence of protective bodies in the fluids about the cells, and perhaps, to a limited degree, upon some cell resistance to injury.

Such a conception accounts for the difficulties of serum therapy with convalescent serum. If we reason from our own herpes experiments, it would seem that even large amounts of protective serum injected into the veins and into the cisterna magna before intracerebral inoculation confer absolutely no protection. Yet this experimental test is a severe one, and treatment with protective serum might well prevent extension from a local area into new cell groups. This is the theoretical basis for serum prophylaxis and for optimism in the limiting value of convalescent serum early applied in poliomyelitis.

There is another fundamental observation in the immunology of these conditions which must influence future investigation. In experiments of Andrewes with virus III and vaccinia, he succeeded in demonstrating that virus persisted, and can be recovered by filtration and dilution from over-neutralized mixtures. Rivers and his associates have shown that vaccine virus can survive for some time in preparations of immune cornea in anti-vaccinal plasma. There is much evidence that filterable agents can survive after recovery. This has been observed by Bang and by Loeffler in foot and mouth disease; it has been reported in contagious epithelioma of fowls, in the salivary gland virus of guinea pigs; and Olitsky and Long have succeeded, by cataphoresis, in separating vaccinia virus from the tissues of rabbits long recovered from cutaneous vaccination. There is indication here that the state of immunity may be related to persistence of the virus. A similar state of affairs has been generally assumed until very lately for syphilis, and it apparently exists also in protozoan diseases. There is here a problem of fundamental importance, since it implies necessity of a continued antigenic stimulus for a prolonged state of resistance.

Incidentally, this persistence of the filterable viruses in tissues after recovery suggests an explanation for the frequent recurrence of herpes, in one and the same place, the virus persisting in the recovered tissues and regaining capacity for cell injury under the influence of local irritation by secretions, sunburn, etc.

I have attempted to give you an account of some of the more important problems that are occupying immunologists at the present time. I have been forced by the nature of my task to confine myself to the bare outlines of my topics. I hope that I may have succeeded in pointing out the possibilities of immunological investigation, and in showing that of all the biological branches of medicine no other is more deeply involved with the problems of the clinic.

BOOK REVIEW

MEDICINE IN MASSACHUSETTS *

This volume, a tribute of The Massachusetts Medical Society to The Tercentenary Celebration of the settling of the Massachusetts Bay Colony (1930) is, true to its title, a history of medical achievements in Massachusetts rather than of Massachusetts medicine by and large. The author, who is in the straight Osler-Cushing tradition, realizes that a work of larger scope would require several volumes and has contented himself with a compact and very readable presentation of "important events in the lives of Massachusetts physicians." Hence we do not find, need not expect to find, any presentation of such archival data as the initiation of organized medical service for the Revolutionary armies (first Army medical examination May 8, 1775), the early quarantine regulations, Lemuel Shattuck's report of 1850, Massachusetts as a prime-mover in public and social hygiene (public charities) and so forth. But the outstanding events, such as the inoculation episode, anæsthesia, the foundation of the medical schools, societies, periodicals and libraries, are set forth in sufficient detail and the text of Thatcher's Brief Rule (1677), the first American publication, is given in full. The successive chapters cover the European background, the Colonial and pre-Revolutionary periods, the Revolution, the early 19th Century, anæsthesia and the period 1847-1930. Letters of John Winthrop (1652) and Samuel Stone (1652) afford sidelights on colonial practice, the text of the first hygienic enactment (1649) is given, there are citations from Cotton Mather on inoculation (1721), the biographic sketches are of admirable brevity and on page 85 we find a list of books presumed to have been in the library of a New England physician of 1770. The book is illustrated with portraits of James Lloyd, John Warren, James Jackson, John

* *A Brief History of Medicine in Massachusetts.* By Henry R. Viets, M.D. X (21.) 194 pp., 8 pl. 80, Boston and New York, Houghton Mifflin Co., 1930. \$4.00.

Collins Warren, Jacob Bigelow, O. W. Holmes and William T. G. Morton. The sentences are terse, compact and to the point, and while in no sense a summation of research work from archival records, the volume is a timely presentation of data important for the general medical history of our country, and will no doubt be widely read.

F. H. GARRISON

A SCIENTIFIC EXHIBIT
with demonstrations
WAS HELD IN THE EXHIBITION ROOM OF
THE NEW YORK
ACADEMY OF MEDICINE
IN CONNECTION WITH
THE THIRD ANNUAL GRADUATE FORTNIGHT
October 20 to 31, 1930

(Open from 9:30 A.M. to 11:00 P.M. daily)

*The exhibit was arranged to illustrate the general subject of the Fortnight,
"Medical and surgical aspects of acute bacterial infections."*

TUESDAY, October 21

- 3:30 - 4:30 Emanuel Libman. Subacute bacterial endocarditis.
8:00 - 8:30 Joseph H. Globus. The inherent healing properties of brain abscess.
8:00 - 8:30 David Sashin. Sacro-iliac arthritis.

WEDNESDAY, October 22

- 3:30 - 4:00 Bernard Samuels. Lantern slide demonstration on metastatic ophthalmia.
3:30 - 4:00 Louis Gross. Colored lantern slides on the life cycle of rheumatic cardiac lesions.
4:00 - 4:30 Mr. E. B. Burchell. a. Lantern slide demonstration on the pathways through which infection passes from the temporal bone into the blood stream. b. Accessory nasal sinuses in relation to the eye.

4:00-4:30 Gregory Shwartzman. Various types of toxins in infections.

8:00-8:30 Paul Klemperer. Autopsy material from infections.

8:00-8:30 C. B. Rabin. Lung infections.

THURSDAY, October 23

3:30-4:30 Emanuel Libman. Subacute bacterial endocarditis.

4:30-5:00 M. H. Soule. Microbic dissociation.

8:00-8:30 Frank Melency. Examples of certain infections of the skin and subcutaneous tissue.

8:00-8:30 David Sashin. Sacro-iliac arthritis.

8:00-8:30 M. H. Soule. Microbic dissociation.

FRIDAY, October 24

3:30-4:00 Bernard Samuels. Lantern slide demonstration on metastatic ophthalmia.

3:30-4:30 Joseph H. Globus. *a.* Mechanism of the production of internal hydrocephalus in the wake of inflammatory brain diseases. *b.* Acute epidemic encephalitis (encephalitis lethargica).

4:00-4:30 Mr. E. B. Burchell. *a.* Lantern slide demonstration on the pathways through which infection passes from the temporal bone into the blood stream. *b.* Accessory nasal sinuses in relation to the eye.

4:30-5:00 M. H. Soule. Microbic dissociation.

8:00-8:30 John O. Polak and Morris Glass. Uterine infections.

8:00-8:30 Nathan Rosenthal. The blood changes in infections.

SATURDAY, October 25

3:30-4:30 John O. Polak and Morris Glass. Uterine infections.

3:30-4:30 Louis Gross. Colored lantern slides on the life cycle of rheumatic cardiac lesions.

8:00-8:30 Harrison Martland. Autopsy material from infections.

8:00-8:30 Joseph Druss. Pathways of infection to the middle ear.

MONDAY, October 27

3:30-4:30 Louis Gross. Colored lantern slides on the life cycle of rheumatic cardiac lesions.

3:30-4:00 Paul Klemperer. Autopsy material from infections.

4:00-4:30 Nathan Rosenthal. The blood changes in infections.

8:00-8:30 John O. Polak and Morris Glass. Uterine infections.

TUESDAY, October 28

3:30-4:30 Emanuel Libman. Subacute bacterial endocarditis.

4:30-5:00 F. d'Herelle. Bacteriophagy.

8:00-8:30 Joseph H. Globus. The inherent healing properties of brain abscess.

8:00-8:30 C. B. Rabin. Lung infections.

WEDNESDAY, October 29

- 3:30 - 4:00 Joseph Druss. Pathways of infection to the middle ear.
 3:30 - 4:30 Joseph H. Globus. a. Mechanism of the production of internal hydrocephalus in the wake of inflammatory brain diseases. b. Acute epidemic encephalitis (encephalitis lethargica).
 4:00 - 4:30 Frank Meleney. Examples of certain infections of the skin and subcutaneous tissue.
 8:00 - 8:30 David Kling. Cells in the knee joint fluid in various inflammatory diseases.
 8:00 - 8:30 Gregory Shwartzman. Various types of toxins in infections.

THURSDAY, October 30

- 3:30 - 4:30 Emanuel Libman. Subacute bacterial endocarditis.
 8:00 - 8:30 Harrison Martland. Autopsy material from infections.
 8:00 - 8:30 Louis Gross. Colored lantern slides on the life cycle of rheumatic cardiac lesions.

FRIDAY, October 31

- 3:30 - 4:00 C. B. Rabin. Lung infections.
 3:30 - 4:30 Harrison Martland. Autopsy material from infections.
 4:00 - 4:30 Joseph Druss. Pathways of infection to the middle ear.
 8:00 - 8:30 David Kling. Cells in the knee joint fluid in various inflammatory diseases.
 8:00 - 8:30 Nathan Rosenthal. The blood changes in infections.

The following exhibits will be shown in addition to those which will be demonstrated as scheduled.

From the United States Public Health Service, through the courtesy of Surgeon General H. S. Cumming and Assistant Surgeon General G. W. McCoy—

Undulant fever. Exhibit prepared by H. E. Hasseltine
 Rocky Mountain spotted fever. Exhibit prepared by R. R. Spencer
 Tularemia. Exhibit prepared by E. Francis

From the Army Medical Museum, through the courtesy of Surgeon General Ireland and Major Callender—

Dysentery. Exhibit prepared by Major Callender
 Anaerobic infections. Exhibit prepared by Major Callender

Through the courtesy of the University of Michigan—
 Microbic dissociation. Exhibit by M. H. Soule

Through the courtesy of Yale University—
 Bacteriophagy. Exhibit by F. d'Herelle

Through the courtesy of the Rockefeller Institute—

Experimental studies on trachoma. Exhibit by P. Olitsky
 Infections of the urogenital tract. Exhibit by Joseph F. McCarthy

A collection of books on topics discussed during the Graduate Fortnight will also be shown.

LIBRARY NOTES

DR. MANGES'S GIFTS TO THE ACADEMY

FIRST RADIIUM FOR TREATMENT IN THIS COUNTRY

A librarian often meets with great surprises when he is confronted with objects, sent as gifts or offered for sale, that find their way to his desk. He is also astonished sometimes at the prices asked in the latter case. One man appeared at the Academy with an "ancient" book—not more than one hundred years old. When a certain modest sum was offered to him, he replied that someone in New Jersey had promised him a thousand dollars for it. He was urged immediately to hasten across the North River as soon as possible to secure his fortune!

The present librarian found a number of things on his table not many months ago, gifts of Dr. Morris Manges, a Fellow of the Academy, and the first one that met his eye was the medical number of *L'Assiette au Beurre* ("Les médecins" par Abel Faivre. [Paris], No. 51, 22 Mars, 1902), which he had heard of but had never seen. After looking through this he discovered beneath it a very early x-ray photograph taken at St. Luke's Hospital. Another gift from the same source consisted of a small cardboard box containing some pieces of quartz and a small test tube filled with large quartz grains and a little black case such as might house a small cigarette holder. It had in it a little metal pointed rod about two and one-half inches long and three-eighths of an inch in diameter, which was pointed at one end like a pencil. It looked as if it might hold a vaccinating needle, but on unscrewing the end, none could be found. Think of the Librarian's feelings when under everything else on the table he found a sheet of paper on which were the words: "From Dr. Manges. First

specimen of radium from Curie." The morsel of radium could not be found on the table or floor, only a scrap of paper with "4.25 mg." written on it. Nor could the quartz be made to glow in a dark cupboard. There was only one thing left to do before the Librarian would have had to confess to the Trustees; the gift had to be taken to a physicist. Down in the subterranean regions of the Memorial Hospital is a very interesting piece of apparatus called a "measuring unit," and when the Librarian was conducted into this room, he was surprised to see the indicator move up on the dial and overjoyed on being told that the radium must still be in the little box. Dr. Gioacchino Failla, the inventor of the instrument said there were about 4.25 milligrams of it in the holder, and added on glancing at the scrap of paper, "Look, I have seen this specimen before, for that is my handwriting."

This is one of the most valuable and interesting things we have in our museum, which by the way is growing week by week. The radium is not of large enough amount to be of value in the treatment of disease, so we should not feel that we are withholding benefits from others. We are indeed grateful to its donor.

Dr. Manges, who was responsible for its being brought to this country, wrote to us on March 7, 1930, "I have ascertained that the date of the purchase of the radium which I gave to the Academy of Medicine was Sept. 1902. This was shortly after the publications of the Curies. The purchase was sent directly from the Curie Laboratory. You may be absolutely certain that this was the first radium which was sent to America for therapeutic purposes."

ARCHIBALD MALLOCH

AN EIGHTEENTH CENTURY MICROSCOPE
GIVEN BY DR. COLEMAN

Dr. Warren Coleman has very kindly given a valuable and interesting microscope for the museum collection. It is contained in an oak case made in the form of a truncated

pyramid, the base of which is rectangular and measures seven and three-quarters by seven inches. The sides are about sixteen and one-half inches high and the top, in which is inserted a brass ring as a handle, is three and seven-eighths by three and six-eighths inches. One face of the pyramid which is hinged and forms a door bears a brass plate on which is engraved:

This Microscope brought from Holland by Jan Evertson Keteltas in the year 1649 is given by his Descendent Henry Keteltas Aug 12th 1895 to Doctor Warren Coleman as a pleasant remembrance.

The microscope is of brass, of the compound type. The barrel rests on three legs, each shaped like an old fashioned printed "s" which are in turn supported by a round brass stage, which has three longer and thicker legs of the same shape provided with feet fastened to a wooden base in which is a drawer. There is a sub-stage concave mirror and also a lens above the stage (revolving on two axes) for use when objects are examined by reflected, and not transmitted, light. The little drawer contains five object lenses of different strengths, several holders for objects to be examined, a small pair of tweezers, a little cylindrical ivory box filled with round mica cover-slips, and several slips of bone three and three-fourths by one-half inches, having four circular holes in a row to contain the specimens mounted between two mica cover-slips. A number of these things are wrapped in bits of paper which when pieced together showed that they formed a leaf of *The Albion a Journal of News Politics and General Literature*, a New York magazine which ran from 1822 until 1875. On the inner side of the door of the case is pasted an oval-shaped paper trade label, part of which has been torn away. Within an ornamental border can be read: "Made by Benjamin Cole Mathematical Instrument Maker at [the] Orrery next the Globe T[heatre?] . . . London." An "Orrery" (named after Chas. Boyle, Earl of Orrery) is "a piece of mechanism devised to represent the motions of the planets about the sun by means of clockwork."

Mr. Alexander J. Wall, Librarian of the New York Historical Society, writes that Jan Evertsen Keteltas came from Lansmeer, in N. Holland and married Aeltje Janse Schepmoes of New York, on 7 July, 1669, in the Dutch Church of New York. He died in the middle of the 1680's. His descendent, Henry Keteltas was living in 1895, when the gift was made to Dr. Coleman, at 37 St. Marks Place.

Now if one turns to p. 186 of vol. i of *Early Science in Oxford* (1923) by R. T. Gunther, since 1924 the Curator of the Lewis Evans Collection of Scientific Instruments at the Old Ashmolean, Oxford, he will find that B. Cole in 1751 succeeded Thomas Wright and continued his business in Fleet Street, London. So in all probability the microscope which has been given to the Academy is of later date than that. My friend, Dr. Gunther, in answer to my query, writes: "I am chary about reporting about instruments I have not seen . . . but I am confident that 1649 is an impossible date for your instrument . . . I describe your instrument as a 'Culpeper Model Tripod Microscope' . . . Your Mr. Keteltas date cannot be trusted for *this* instrument, but it is possible that Jan Evertson K. brought *another* from Holland in 1649, which was replaced by this one *more* than one hundred years later."

This, the oldest microscope we have, is a very welcome addition for the museum.

ARCHIBALD MALLOCH

ACADEMY LIBRARY ACTIVITIES OF BENEFIT TO THE MEDICAL LIBRARY WORLD IN GENERAL

The Library of The New York Academy of Medicine carries on a large amount of work outside its regular activities, benefiting medical libraries all over the world, at considerable cost to itself. The results of such labors in 1929 amount to a rather surprising total, when reduced to dollars and cents. A brief survey of this work may per-

haps be of interest, especially to those Fellows of the Academy through whose donations to the Library much of this has been made possible.

The Academy received from various Fellows in 1929, 10,509 books and 52,193 journals. Of these the Library kept for its primary sets about 1863 books and 3925 journals, valued at approximately \$4700, and for its duplicate sets, about 14,480 journals, worth \$3620, making a total of material valued at \$8320 added to the Academy collection. Of the remainder, we first distributed to 89 libraries in this country and Canada through the Medical Library Association Exchange 376 books and 7867 journals. After Exchange requests had been filled we gave directly to seven libraries who are not members of the Exchange, two of them in China, 1705 books and 5104 journals, worth about \$4686. This makes a total given away valued at \$7404. Fellows of the Academy have therefore contributed to medical libraries in one year, books and journals to the value of \$15,724. The handling of all this has, of course, cost the Academy a good deal. As nearly as can be estimated, the collection of these donations, their acknowledgment, checking and distribution, cost about \$2860 in 1929. The proportion spent for books not kept by the Academy was \$1513. This has not been met by any special appropriation, but has been done in the time of the regular library staff.

Another activity in which the Academy Library has taken part is in contributing to the compilation of the *Union List of Serials*. This contains the periodical holdings of 225 libraries in the United States and Canada, up to 1925, about 75,000 entries. The total cost was about \$70,000. The Academy subscribed \$1800 towards this and in addition paid \$2850 as the cost of listing its holdings. In 1930 an annual supplement was inaugurated, to be issued in quarterly installments, the Academy's work for which comes to about \$500 yearly. The Academy's share in supporting this project has thus far, then, amounted to \$5150. The value of the work to the general library

world cannot be estimated in money. It is a reference book of immense bibliographical and practical value, giving the titles, extent and location of all journals in the libraries of North America. If we do not have a journal, the *Union List* indicates what library does have it and exactly what volumes it has. It tells us what forms a complete set of any journal, so that we do not buy incomplete ones—and there are scores of other uses to which it is put daily. It is of especial importance to medical libraries, since more than half their literature is in periodical form.

The Academy Library conducts an extensive inter-library loan circulation. During the first nine months of 1930 we lent 460 books to 50 different libraries scattered over the United States and Canada, at a cost of \$262.80. (This does not include transportation charges, which are paid by the borrowing library). For the entire year, the cost would be, at this rate, about \$350.00. Moreover, the Library acts as a bureau of information for individuals and libraries all over the country, answering anywhere from one to a dozen inquiries a day, on topics that range from the number of operations required for admission to the American College of Surgeons to the color of Pasteur's hair. Most queries are sober enough, however, and entail no small amount of research and careful attention to bibliographical details. All this requires daily a couple of hours time for one assistant, and not seldom that of the librarian himself.

Altogether then, the Academy Library spends annually for the benefit of other libraries a total of \$2363. In addition to this expenditure, it gives away to them books and journals valued at about \$7400—and at the same time makes our entire collection and the reference facilities of our staff available to any doctor in the country. We serve not only New York City, but the entire medical world.

JANET DOE
Assistant Librarian.

RECENT ACCESSIONS TO THE LIBRARY

- de Abreu, M. Études radiologiques sur le poumon et le médiastin.
Paris, Masson, 1930, 199 p.
- de Abreu, M. Radiographie néphro-cholécystique.
Paris, Masson, 1930, 157 p.
- Axtell, L. A. Grow thin on good food.
N. Y., Funk, 1930, 336 p.
- Barbillion, L. Études critiques d'histoire de la médecine.
Paris, Baillière, 1930, 237 p.
- Behandlung (Die) der rheumatischen Krankheiten.
Leipzig, Kornfeld, 1930, 258 p.
- Besredka, A. Le choc anaphylactique et le principe de la désensibilisation.
Paris, Masson, 1930, 275 p.
- Binet, L. La rate, organe réservoir.
Paris, Masson, 1930, 116 p.
- Birdwood, G. T. Clinical methods for students in tropical medicine. 4. ed.
Calcutta, Thacker, 1930, 366 p.
- Boigey, M. A. J. Éducation physique de l'enfance et de l'adolescence.
Paris, L'Expansion Scient. Française, 1929, 250 p.
- Bonaduce, F. Malattie delle unghie.
Bari, Cressati, 1929, 117 p.
- Borchardt, L. Klinische Konstitutionslehre . . . 2. Aufl.
Berlin, Urban, 1930, 386 p.
- Boutelier, A. Quelques dermatoses communes de l'enfance.
Paris, Gauthier, 1930, 231 p.
- British dental association. The jubilee book.
London, Bale, 1930, 145 p.
- Brown, L. & Sampson, H. L. Intestinal tuberculosis. 2. ed.
Phil., Lea, 1930, 376 p.
- Brown, W. L. & Hilton, R. Physiological principles in treatment. 6. ed.
London, Baillière, 1930, 464 p.
- Brüning, H. Bäder-und Kurortlehre für das Kindesalter.
Stuttgart, Enke, 1930, 295 p.
- von Buddenbrock, W. Bilder aus der Geschichte der biologischen Grundprobleme.
Berlin, Borntraeger, 1930, 158 p.
- Curtis, A. H. A text-book of gynecology.
Phil., Saunders, 1930, 380 p.
- Delherm, L. & Laquerrière, A. Électrothérapie gynécologique.
Paris, Gauthier, 1929, 104 p.
- Deschiens, R. & Carvaillo, R. La coprologie en pratique médicale.
Paris, Maloine, 1929, 129 p.
- Erdmann, R. Praktikum des Gewebepflege. 2. Aufl.
Berlin, Springer, 1930, 148 p.

- Evans, C. A. L. Recent advances in physiology. 4. ed.
London, Churchill, 1930, 446 p.
- Ewing, A. W. G. Aphasia in children.
London, Milford, 1930, 152 p.
- Fimiani, A. Linfogramulomatosi inguinale subacuta.
Napoli, Panaro, 1929, 52 p.
- Forgue, E. & Basset, A. La rachianesthésie.
Paris, Masson, 1930, 222 p.
- Fornet, W. Unbekanntes vom Insulin.
München, Gmelin, 1929, 41 p.
- Franco, P. M. Le pseudotubercolosi e le sindromi pseudotubercolari del
polmone.
Napoli, Idelson, 1930, 290 p.
- Frumusan, J. The cure of obesity. 2. ed.
London, Bale, [1930], 124 p.
- Galli, G. Le neurosi del cuore e dei vasi sanguigni e loro cura.
Milano, Soc. Editrice Libreria, 1930, 361 p.
- Genner, V. Études cliniques sur la pelade.
Copenhagen, Levin, 1929, 581 p.
- Gray, H. Anatomy of the human body. 22. ed.
Phil., Lea, 1930, 1391 p.
- Gregoire, R. Les anévrysmes artério-veineux.
Paris, Baillière, 1930, 214 p.
- Howell, W. H. A text-book of physiology. 11. ed.
Phil., Saunders, 1930, 1099 p.
- Jaworski, H. Comment rajeunir.
Paris, Michel, 1930, 248 p.
- Jellett, H. A short practice of midwifery. 10. ed.
London, Churchill, 1930, 662 p.
- Justin-Besançon, L. Les fonctions internes du rein.
Paris, Masson, 1930, 370 p.
- Kiss, J. Technik und Theorie der Serumuntersuchung auf Syphilis.
Jena, Fischer, 1930, 88 p.
- Klose, E. Kinderheilkunde. 12. Aufl.
Leipzig, Verband der Ärzte Deutschlands, 1930, 256 p.
- Kugelmass, I. N. Clinical nutrition and feeding in infancy and childhood.
Phil., Lippincott, [1930], 345 p.
- Lang, M. T. Dentistische Rechtskunde.
München, R. D. D. Verlag für Dentistik, [1930], 2 v.
- Ledoux-Lebard, R. & Piot, E. La radiothérapie pénétrante.
Paris, Gauthier, 1930, 82 p.
- Lévi, L. Le tempérament et ses troubles, les glandes endocrines.
Paris, Oliven, [1929], 363 p.
- Lortat-Jacob, L. & Solente, G. La cryothérapie.
Paris, Masson, 1930, 246 p.

- McGehee, W. H. O. A text-book of operative dentistry.
Phil., Blakiston, [1930], 932 p.
- Markianos, J. L'interprétation de la réaction sérologique de Bordet-Wassermann, au cours de la syphilis.
Paris, Vigot, 1930, 102 p.
- Mangiagalli, L. Trattato de ginecologia.
Milano, Vallardi, 1930, pt. 1.
- Miranda Gallino, M. El cuociente cardio-torácico.
Buenos Aires, El Ateneo, 1929, 86 p.
- Monscourt, H. J. P. La rhinite atrophique et son traitement.
Paris, Maloine, 1929, 228 p.
- Naegeli, T. Schematische Skizzen zur Einführung in die Chirurgie. 2. Ausg.
Leipzig, Vogel, 1930, 216 p.
- Nicolle, C. Naissance, vie et mort des maladies infectieuses.
Paris, Alcan, 1930, 219 p.
- Oliver, W. W. Stalkers of pestilence.
N. Y., Hoeber, 1930, 251 p.
- Pagniez, P. L'épilepsie.
Paris, Masson, 1929, 199 p.
- Pearson, W. J. & Wyllie, W. G. Recent advances in diseases of children.
2. ed.
London, Churchill, 1930, 548 p.
- Précis d'hygiène et des maladies de la première enfance.
Paris, Baillière, 1930, 1078 p.
- Rolleston, (Sir) H. D. Internal medicine.
N. Y., Hoeber, 1930, 92 p.
- Ronchèse, A. Guide pratique pour l'analyse des urines. 4. éd.
Paris, Baillière, 1930, 472 p.
- Rouèche, H. Notions d'hygiène sociale de l'enfance.
Paris, Maloine, 1930, 100 p.
- Schiassi, F. La stitichezza abituale.
Milano, Vallardi, 1930, 140 p.
- Schmalhausen, S. D. Our changing human nature.
N. Y., Macaulay, 1929, 510 p.
- Sharp, W. B. The foundation of health. 3. ed.
Phil., Lea, 1930, 308 p.
- Smallwood, W. M. A text-book of biology. 6. ed.
Phil., Lea, 1930, 470 p.
- Solomons, B. Practical midwifery for nurses.
London, Milford, 1930, 354 p.
- Stéphani, J. La tuberculose pulmonaire.
Paris, Payot, 1929, 314 p.
- Text-book (A) of medicine by American authors . . . 2. ed.
Phil., Saunders, 1930, 1592 p.
- Therapie, (Die) an den Wiener Kliniken. 11. Aufl.
Leipzig, Deuticke, 1930, 839 p.

- Thornhill, R. Varicose veins, haemorrhoids, varicocele, hydrocele and their treatment by injection. [2. ed.]
London, Baillière, 1930, 112 p.
- Umstimmung als Behandlungsweg.
Leipzig, Thieme, 1930, 262 p.
- Vignes, H. Physiologie gynécologique et médecine des femmes.
Paris, Masson, 1929, 565 p.
- Villaret, M.; Saint Girons, F. & Justin-Besançon, L. La pression veineuse périphérique.
Paris, Masson, 1930, 318 p.
- Voltz, F. Dosage tables for röntgen therapy.
London, Milford, 1930, 120 p.
- Voronoff, S. & Alexandrescu, G. La greffe testiculaire du singe à l'homme.
Paris, Doin, 1930, 88 p.
- Warren, S. The pathology of diabetes mellitus.
Phil., Lea, 1930, 212 p.
- Whitman, R. A treatise on orthopaedic surgery. 9. ed.
Phil., Lea, 1930. 1085 p.
- Wood, B. M. & Weeks, A. L. Fundamentals of dietetics. 2. ed.
Phil., Saunders, 1930, 243 p.

PROCEEDINGS OF ACADEMY MEETINGS

OCTOBER

STATED MEETINGS

Special Notice

There will be no Stated Meeting of the Academy on October 2.

The next Stated Meeting will be that of October 16. The program will appear in the second October folder.

Thursday Evening, October 16, at 8:30 o'clock

I. EXECUTIVE SESSION OF THE ACADEMY

II. ELECTION OF FELLOWS

THE FIRST HARVEY LECTURE

"The Female Sex Hormone"

ROBERT T. FRANK

Mt. Sinai Hospital, New York

Alfred E. Cohn, President Harvey Society

Dayton J. Edwards, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for October

SECTION MEETINGS

SECTION OF SURGERY

Friday Evening, October 3, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. A case of bleeding Meckel's diverticulum, Rudolph N. Schullinger
- b. Epithelioma of the heel; excision; pedicle graft, Kingsley Roberts
- c. 1. Acute cholecystitis and cholelithiasis complicated by acute intestinal obstruction of hepatic flexure of colon
2. Branchio-genetic cyst (two cases), Herbert M. Bergamini
- d. Cases illustrating the paper of the evening, George T. Pack (by invitation)

III. PAPER OF THE EVENING

- a. The development of cancer in burn scars, Norman Treves (by invitation)

George T. Pack (by invitation)

IV. DISCUSSION

Franz J. A. Torek, Frederic W. Bancroft, George C. Andrews

SECTION OF DERMATOLOGY AND SYPHILOLOGY
Tuesday Evening, October 7, at 8:30 o'clock
ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. 1. Cases from Cornell Clinic
 2. Miscellaneous cases
- III. GENERAL DISCUSSION
- IV. EXECUTIVE SESSION

SECTION OF OTOTOLOGY
Friday Evening, October 10, at 8:30 o'clock
ORDER

- I. READING OF THE MINUTES
 - II. PRESENTATION OF CASES
 - III. PAPERS OF THE EVENING
 - a. The histologic anatomy of the inner ear with special reference to the cochlea (lantern demonstration), Marvin F. Jones
 - b. A method of determining the density of innervation of the organ of Corti as a whole and by regions, and correlations of differences of the same with differences in the acuity of hearing (lantern demonstration), Stacy R. Guild, Ph.D., Johns Hopkins Medical School (by invitation)
 - Discussion, Edmund P. Fowler (by invitation), Frank H. Pike, Ph.D., Columbia University (by invitation).
 - IV. GENERAL DISCUSSION
 - V. EXECUTIVE SESSION
- Discussion of papers and cases is limited to Fellows of the Academy and specially invited guests.*

SECTION OF PEDIATRICS

Instead of the regular October meeting of the Section, there will be a combined meeting of the Philadelphia Pediatric Society, the New England Pediatric Society and the Section of Pediatrics of The New York Academy of Medicine, in New York City at the Babies' Hospital Amphitheatre, Medical Center, 167th Street and Broadway, Saturday morning October 11, at 9:00 o'clock. A detailed schedule of the day's program will be mailed to members of the Section at a later date.

SECTION OF NEUROLOGY AND PSYCHIATRY
Tuesday Evening, October 14, at 8:30 o'clock
ORDER

- I. READING OF THE MINUTES
- II. PAPER OF THE EVENING
 - a. Chairman's Address. The problem of mental disease and delinquency in the adolescent (to be read by title), Michael Osnato
 - b. Some principles in the treatment of behavior problems, Lawson G. Lowrey, Director, Institute for Child Guidance (by invitation)

- c. Maternal over-protection and rejection, David M. Levy, Chief of Staff, Institute for Child Guidance (by invitation)
- Discussion, H. E. Hawkes, Dean, Columbia University (by invitation), G. S. Amsden (by invitation), Edith R. Spaulding, Sanger Brown, 2nd

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, October 15, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
- III. PAPER OF THE EVENING
 - Further report on renal hematuria, with special reference to the role of ureteral stricture in the so-called essential hematurias, Guy L. Hunner, Johns Hopkins Medical School (by invitation)
 - Discussion, Henry D. Furniss, Edward L. Keyes, Oswald S. Lowsley, Nathaniel P. Rathbun, Alexander R. Stevens
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, October 17, at 8:30 o'clock

ORDER

- I. PRESENTATION OF CASES
 - a. Two cases of scoliosis treated by Bent jacket and spine fusion, Joseph C. Risser (by invitation)
 - b. Cases of fusion in poliomyelitis, Mather Cleveland
 - c. Cases of removal of sesamoid bones of the great toe joint, George Inge (by invitation)
- II. PAPERS OF THE EVENING
 - a. A jacket for correction of scoliosis, Joseph C. Risser (by invitation)
 - b. Results of fusion of unstable knees in cases of poliomyelitis, Mather Cleveland
 - c. Results of removal of sesamoid bones of the great toe joint, George Inge (by invitation)

SECTION OF OPHTHALMOLOGY

Monday Evening, October 20, at 8:30 o'clock

The program for the Opening Session of the Third Annual Graduate Fortnight has been arranged by courtesy of the Section of Ophthalmology. No other meetings of the Section, therefore, will be held in October. (See Graduate Fortnight program.)

SECTION OF MEDICINE

Tuesday Evening, October 21, at 8:30 o'clock

The program has been arranged for the Graduate Fortnight by courtesy

of the Section of Medicine. No other meeting of the Section, therefore, will be held in October. (See Graduate Fortnight program.)

SECTION OF LARYNGOLOGY AND RHINOLOGY
Wednesday Evening, October 22, at 8:30 o'clock

ORDER

Program arranged in conjunction with the
THIRD ANNUAL GRADUATE FORTNIGHT

- I. a. Infections arising from tonsils and sinuses. The general or constitutional symptoms secondary to different types of sinusitis and tonsillitis. Sinus headache. Spheno-palatine ganglion syndrome secondary to neighborhood infections. Blindness from sinus infections. Thyroid reaction to upper respiratory infections. Thoracic reaction to the same, John Edmund Mackenty, Senior Surgeon, Manhattan Eye, Ear and Throat Hospital
- b. Infections of the middle ear (acute systemic infections from the ear) The interest generally in systemic infections; the particularly interesting problems of systemic infections of otitic origin; bacteriology, pathological changes; common and unusual symptoms; treatment and results, Isidore Friesner, Otologist to the Mount Sinai Hospital
- c. Acute infections of the face and oral cavity.
Occurrence of; types; etiology; diagnosis. Symptoms: local; general. Influence on systemic diseases. Treatment, Henry Sage Dunning, Professor of Oral Surgery, Columbia University Dental School

THE NEW YORK ACADEMY OF MEDICINE
THE WESLEY M. CARPENTER LECTURE
Wednesday Evening, October 29, at 8:30 o'clock

Program arranged in conjunction with the

ANNUAL GRADUATE FORTNIGHT

Immunity—general and local

The physiological significance of the mechanism of immunity—natural and acquired immunity discussed—general and local factors which participate—relationship between the significant chemical constituents of the invading microorganism and cells in antibody formation—relationship between hypersusceptibility and immunity—types of immunity as represented by resistance against the various acute infections—some of the more chronic infections, like syphilis—filterable viruses and protozoa, Hans Zinsser, Professor of Bacteriology and Immunology, Harvard Medical School

SECTION OF OBSTETRICS AND GYNECOLOGY
Tuesday Evening, October 28, at 8:30 o'clock

The program has been arranged for the Graduate Fortnight by courtesy of the Section of Obstetrics and Gynecology. No other meeting of the Section, therefore, will be held in October. (See Graduate Fortnight Program.)

NEW YORK PATHOLOGICAL SOCIETY
In affiliation with
 THE NEW YORK ACADEMY OF MEDICINE
Announces the
 MIDDLETON GOLDSMITH LECTURE
 for 1930

by
 CYRUS C. STURGIS

Professor of Medicine, Director, Department of Internal Medicine, Director
 of the Thomas Henry Simpson Memorial Institute for Medical Research,
 University of Michigan, Ann Arbor, Michigan

on
 RECENT DEVELOPMENT IN THE TREATMENT OF PERNICIOUS
 ANEMIA AND A CONSIDERATION OF THE ETIOLOGY OF THE
 DISEASE

Saturday Evening, October 18, at 8:30 o'clock
in Hosack Hall

THE NEW YORK ACADEMY OF MEDICINE
 2 East 103 Street

This lecture will replace the regular October meeting of the New York
 Pathological Society

Leila Charlton Knox, President, St. Luke's Hospital
 Beryl H. Paige, Secretary, The Presbyterian Hospital

NEW YORK ROENTGEN SOCIETY
In affiliation with
 THE NEW YORK ACADEMY OF MEDICINE
 Monday Evening, October 20, at 8:30 o'clock
This meeting will be held at the
 BLUMENTHAL AUDITORIUM
 (Mt. Sinai Hospital)
 1 East 99 Street

ORDER

- I. PRESENTATION OF ROENTGENOGRAMS, CASES, ETC.
- II. PAPER OF THE EVENING
 "Pulmonary and pleural tumors—correlation of roentgenological and
 pathological findings." Demonstration of specimens and slides,
 Coleman B. Rabin
- III. GENERAL DISCUSSION
 To be opened by Leopold Jaches, Harry Wessler, Paul Klemperer
- IV. EXECUTIVE SESSION
 Ross Golden, President
 J. Bennett Edwards, Secretary

insistence upon correct and dignified usage in the composition of medical papers.

In practical surgery Dr. Brickner made his mark by his papers on the conditions vaguely grouped as "shoulder trouble," *viz.*, traumatic forward subluxation at the shoulder-joint (1915), subacromial bursitis (1915), and his ingenious method of treating these disorders. He introduced radiography into Mount Sinai Hospital. A career of great promise was interrupted by our entry into the European War, but, having taken preliminary military training at Tobyhanna as an officer of the Medical Reserve Corps, he responded to the call to duty at once. Upon him devolved largely the organization of the Mount Sinai Hospital Unit (Base Hospital No. 3), in particular the assemblage of enlisted personnel, and on the Western Front he was successively head of an operating team in an Evacuation Hospital during the St. Mihiel and Meuse-Argonne offensives, Chief of Surgical Service in Base Hospital 3, and, working later on with Cushing, Consultant in Neurological Surgery, Base Section 2. To our Medical History of the War, he contributed data on diphtheria infection in war wounds, and pelvic actinomycosis in soldiers (1925). His other surgical contributions include papers on spina bifida occulta (1909), ruptures of muscles and tendons (1928) and a method of treating chronic bone abscesses by evacuating through a small drill hole (1923).

On June 22, 1914, he became a Fellow of the American College of Surgeons and was subsequently appointed a Governor (1927-1929). He was also a Fellow of the American Medical Association and of the New York Academy of Medicine, a Member of the New York Surgical Society and the Association of Military Surgeons, and affiliated with such patriotic organizations as the Sons of the American Revolution, the American Legion and the Military Order of the World War.

My first meeting with Dr. Brickner happened under circumstances definable as dramatic to the point of being melodramatic. I was attending a meeting of a medical

society which turned out to be of factional character. Feeling ran high, with alarms and excursions and rumors of war in the wings, to the detriment of the ordinary objective of such meetings. At intervals Brickner rose to quell the storm by some timely interjection of wit and sense, and I was immediately attracted by his clear and characterful personality, his genial poise and judgment, his keen sense of humor and his graceful manner and diction. I sought his acquaintance and endeavored to dissuade him from futilities likely to interfere with progress in his chosen profession, in which he seemed predestined to make his mark. He was one of the few human beings whose friendship I have ever deliberately sought, and in a brotherly relationship of sixteen years standing, I never had occasion to regret the step taken. He was one of the best and truest friends I have had in life. Wherever he was disappointed in me was due to the fact that the demands made upon the time and patience of public servants in official life are often such as to render the best willed stupefied, benumbed, torpid and "to dumb forgetfulness a prey." At the time of my meeting with him, Dr. Brickner's humorous contributions, notably the *Medicinal Gewalt* with its slanting allusion to the groans of surgical patients in Mount Sinai, were among the most piquant *jeux d'esprit* of the period. These will be assembled and published as a memento of what was latent within his strong sense of personal and professional dignity. Devoid of effeminate vanity, yet with a pardonable degree of manly pride, a staunch American, a good soldier, he was never carried away by the fashions and follies of the hour, but believed in the religion of character. His benign devotion to his patients and his profession is best described in the parting utterance of Dr. Lee Frankel at his grave:

"To Walter Brickner, medicine was more than either a vocation or an avocation; to him it was a sacrament, a call to duty to be answered irrespective of cost or of time. He never wavered when suffering required him. Childless himself, his patients became his children and he lavished all the devotion and love of a father upon those who came under his ministering care."

F. H. GARRISON

DEATH NOTICE

HERMON CAMP GORDINIER, M.D., 89 Fourth Street, Troy, N. Y.; graduated in medicine from the Albany Medical College, in 1886; elected a Fellow of the Academy May 2, 1916; died, October 19, 1930. Dr. Gordinier was a Fellow of the American Medical Association, a Fellow of the American College of Physicians, a member of the American Neurological Society, a member of the American Physicians Society, a member of the American Therapeutic Society, Physician to Samaritan and Mary McClellan Hospitals, Cambridge, Chief of the Medical and Neurological Clinic to Mary McClellan Hospital, and Physician to Samaritan Hospital, Out Patient Department.

BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

VOL. VI

DECEMBER, 1930

No. 12

ANNUAL GRADUATE FORTNIGHT

FOCAL INFECTION AS THE CAUSE OF GENERAL DISEASE*

FRANK BILLINGS

Professor Emeritus of Medicine,
University of Chicago

Focal infection as an etiologic factor of general diseases is now an established pathological principle.

During the last twenty years an enormous literature on the subject has accumulated. As this literature is available, this address will deal chiefly with the important principles of focal infection.

A few general diseases only, caused by focal infection will be cited; but sufficient in number to illustrate the principles discussed.

Focal infection may be either primary or secondary. A primary focus is a circumscribed area of infected tissue communicating with a mucous, a serous or cutaneous surface. Secondary foci of infection are usually the direct results of infection from primary foci through contiguous tissue or of distant tissues through the blood stream or lymph channels.

SITE OF PRIMARY AND SECONDARY FOCI OF INFECTION

The most common site of a primary focus of infection is about the head including the teeth and jaws, the faucial tonsils, the lymphoid tissue of the nasopharynx, the acces-

*Delivered October 20, 1930.

sory nasal sinuses, the mucosa of the upper nasal cavities, the middle ear and mastoid cells. Less frequently primary foci are located in the skin including pyogenic infection of finger and toenails; in the bronchi as bronchiectatic cavities; ulcers acute or chronic in the intestinal tract and rectum including infected hemorrhoids; in the genitourinary tract, fallopian tubes, venous sinuses of the uterus, seminal vesicles, the deep urethra and prostate.

Secondary foci of infection occur in the lymph vessels and nodes, especially of the neck and mediastinum and mesentery. In the gallbladder and appendix vermiformis as chronic infection. In distal tissues anywhere in the body in the form of metastases.

MODES OF TRANSMISSION OF BACTERIA AND TOXINS FROM THE FOCI OF INFECTION

The usual mode of transmission of the infectious agents or their toxins from the primary focus of infection is hematogenous. In diphtheria the toxin excreted by the diphtheria bacilli circulates in the blood and causes reactions manifested in that disease. From the focus of infection caused by the endotoxic bacteria, the infectious agents as bacterial emboli may be carried in the blood stream to distant tissues and lodge in the small blood vessels. It is not improbable that autolysis of endotoxic bacteria may occur in a primary focus and the toxin set free circulate in the blood stream.

Lymphogenous transmission: Lymph nodes proximal to primary foci may become secondary foci of infection and persist after the removal of the primary focus. The infectious agents may cause local disturbance in the lymph nodes or surrounding tissues, may filter onward through the connecting lymph channels and nodes causing additional secondary foci; may finally reach the blood stream and reinforce the infectious agents primarily transmitted through the blood stream. The infectious agents in the lymph nodes may be held there as a latent infection for an indefinite period and finally through some cause become

pathologically active and cause manifest clinical, local or general disease; this is especially true of tuberculosis.

THE BEHAVIOUR OF THE PATHOGENIC MICROÖRGANISM IN THE METASTASES

The behaviour of the infectious agents carried through the blood stream to distant tissues as bacterial emboli is dependent on the virulence of the microörganisms. If virulent, the reaction of the tissues is characterized by severe local disturbance, the accumulation of leucocytes and lymph cells through chemostasis resulting in a circumscribed abscess or necrosis or gangrene.

If the infectious agents are mildly virulent, the reaction in the tissues is characterized by proliferation of the endothelium of the blood vessel partly or wholly obstructing the local blood flow, slight hemorrhage into the tissues and a serous or serofibrinous exudate in the local tissues.

These tissue reactions to virulent pathogenic microörganisms and also to the less virulent forms of bacteria can be observed in patients and also in experimental animals intravenously injected with the respective pathogenic microörganisms. In the patient the classic example of virulent infection is seen in abscess or necrosis or gangrene in appendicitis; and of the effect of less virulent infectious agents in glomerular nephritis characterized by varying degrees of hematuria, albuminuria and cylindruria which often disappear rapidly with a prompt removal of the causative focus of infection.

TROPISM

At this point in the discussion of the subject it is necessary to discuss the possible quality of tropism of the infectious microörganisms causing focal infection.

Tropism is found to a considerable degree in the typhoid bacillus. Apparently the disease begins as a bacteriemia and the lymphoid tissue, the solitary glands and Peyer's patches of the ileum and colon are the chief tissues at-

tacked in the course of the disease. Early in the disease the typhoid bacillus as emboli cause petechiæ of the skin; through the blood stream reach the gallbladder, usually become latent within the organ creating typhoid carriers and perhaps at some time cholecystitis with or without gallstones.

The pneumococcus of all types possesses a true tropism for lung tissue.

A strain of the *Treponema pallidum* possesses a tropism for the tissues of the brain, spinal cord and meninges. The meningococcus has a tropism for the meninges of the brain and cord. The ultramicroscopic filterable virus of infantile paralysis possesses a tropism for the gray motor tracts of the spinal cord and brain and little or none for the gray matter of the sensory tracts.

Animal experimentation by clinical bacteriologists seems to fortify the quality of tropism in strains of streptococci and also that tropism may be acquired by streptococci through special methods of culture in the laboratory. In 1902, G. Forssner (3) produced a specific tropism for the kidney in a strain of ordinary *Streptococcus hemolyticus* by culture in kidney and kidney extract. When this strain of streptococcus was injected intravenously into animals it produced constantly outspoken lesions of the kidney. This tropism was lost when the specific kidney strains were again cultivated in ordinary bouillon. E. C. Rosenow (2) has for many years maintained that specific tropism can be induced in streptococci and other pathogenic bacteria by repeated intravenous injections of any respective pathogenic bacteria and varying technic in methods of culture.

While the quality of tropism in infectious agents is an important principle, it has been and continues to be a controversial question. Even with those adherents of tropism as an important factor in focal infection relating to general disease, it must be conceded that bacteriemia of some degree due to a focus of infection, must cause more or less injury to all the tissues and organs in general disease even

though the quality of tropism may injure some tissue or organs more than others.

The fact is that in the hematogenous invasion of the body by pathogenic bacteria, even with infectious agents of mild virulence, widely extended injury of varying degrees occurs even though the chief clinical expression may be restricted to one organ or to the tissues and joints in acute or chronic arthritis. It must also be borne in mind as a principle that the injury inflicted to the small blood vessels by the infectious agent in the blood stream has an important influence on the immediate and future course of the general disease.

CHARACTER OF THE INFECTIOUS MICROORGANISMS OF FOCI OF INFECTION

The dominant infectious agents causing foci of infection are the streptococci; *S. hemolyticus*, *S. viridans*; staphylococci; *S. albus*, *S. aureus*; the tubercle bacillus; the gonococcus; the diphtheria bacillus; the colon bacillus when removed from its normal habitat and in mixed infection with other pathogenic bacteria.

The incidence of primary foci of infection, especially of the mouth, tonsils and upper air passages is very great. In addition to the presence of innumerable saprophytes, the mouth and pharynx contain various strains of streptococci, staphylococci, pneumococci, diphtheria bacilli and other bacteria in a latent state which may become pathogenic.

Foci involving the teeth and gums usually include pyorrhea, pulp infection and apical root involvement. In these lesions are found strains of streptococci, staphylococci, fusiform bacilli and other less important bacteria.

Acute and chronic tonsillitis may occur at any age, but more frequently in children because of the presence of an excess of lymphoid tissue in the pharynx. The tonsils are exposed to infection through contaminated air, infected food especially milk and by direct contact with other infected individuals. The faucial tonsils may, when small, look inno-

cent because of the smoothness of the overlying mucous membrane which may obstruct infected crypts. So too, the stumps of tonsils, the remains of tonsillotomy, may contain infected crypts sealed in by the operative scar. The infected tonsils and other lymphoid tissue of the throat may yield cultures of streptococci, *Micrococcus catarrhalis*, pneumococci, diphtheria bacilli and sometimes tubercle bacilli. Infection of the accessory nasal sinus is a very frequent occurrence in the changeable seasons of the year. The most frequent bacterial causes of sinusitis, both acute and chronic, are strains of streptococci, pneumococci and sometimes staphylococci.

Chronic bronchitis when associated with emphysema, asthma and bronchiectatic cavities becomes a focus of infection which may cause general disease and also tropho-metabolic changes in bones and joints. In the conditions named the sputa usually yield cultures of many saprophytic bacteria and other microorganisms as well as streptococci, staphylococci and fusiform anaerobes.

The intestinal tract and its appendages may be the site of primary and secondary foci of infection. Here the cause may lie in acute or chronic ulcers associated with stasis of the intestinal contents, in ulcers of the rectum and in infected thrombotic hemorrhoids. In addition to the colon bacilli, streptococci and other pathogenic bacteria may gain entrance to the intestinal canal by swallowing infectious material from the mouth or nose and through infected food especially milk. These pathogenic agents may cause infection of the lymph nodes of the mesentery and remain as secondary foci.

The appendix vermiformis is susceptible to infection, both acute and chronic, by streptococci and other infectious agents through the blood stream. In the acute type, surgical removal is usually prompt. In the chronic and recurrent type, it becomes a focus of infection especially in relation to the proximal mesenteric glands and lymph vessels which may lead to infection of the liver and sub-diaphragmatic tissues.

The gallbladder is subject to infection through the blood stream by the typhoid bacillus and by strains of streptococci. The colon bacillus is sometimes present as a mixed infection. Chronic cholecystitis often undetected, is a not infrequent focus of infection causing general disease.

Immediately after miscarriage or abortion or infection at childbirth, pathogenic bacteria usually *Streptococcus hemolyticus*, may reach the venous sinuses of the uterus, cause infected thrombi with resulting bacteriemia with serious systemic results.

The fallopian tubes are susceptible to infection with the gonococcus which may cause obliterating salpingitis or abscess and may cause peritonitis. Tuberculous salpingitis may lead to peritonitis, or to tuberculous invasion elsewhere. The deep urethral tract, prostate gland and especially the seminal vesicles are frequently infected with the gonococcus and sometimes as a mixed infection with streptococci. Gonococcus infection of the seminal vesicles may be acute or chronic and as a primary focus of infection may lead to arthritis acute or chronic, gonorrheal bacteriemia and ulcerative endocarditis.

The skin and its appendages may be the site of foci of infection in the form of furuncles, abscesses about the finger and toenails, blisters and abrasions infected with the ever present staphylococcus on the skin and sometimes by streptococci.

SUSCEPTIBILITY TO FOCAL INFECTION

Susceptibility to focal infection involves the question of natural and acquired immunity to disease. Natural and acquired immunity is never absolute. It may be diminished partly or wholly by all of the causes of mental and physical debility including poor inheritance, squalor, poverty, poor sanitation domiciliary and community, neglect of personal hygiene, contaminated food and drink, chronic non-infectious general disease, alcoholic and drug addiction and other causes. An unbalanced diet deficient in the specific vitamins may result in anatomical defects of the

jaws and teeth inviting infections, also infantile scurvy, rickets and to other defects in physical growth and development. To these causes of susceptibility to focal infection must be added contact infection of the mouth and upper air passages with streptococci and other pathogenic bacteria and also of the sexual organs with the gonococcus and *Treponema pallidum*.

SUSCEPTIBILITY TO GENERAL AND ALSO TO LOCAL DISEASE FROM THE FOCUS OF INFECTION

The incidence of general and local disease from the focus of infection is notably small in comparison with the incidence of primary and secondary foci of infection. The marked prevalence of infection of the jaws and teeth is not associated with the frequent incidence of acute or general disease. The incidence of chronic gonorrheal infection of the deep urethra, prostate gland and seminal vesicles is very great as compared with the occurrence of gonorrheal arthritis, tenosynovitis, gonococcemia and ulcerative endocarditis.

The relatively rare incidence of systemic disease as compared with the marked prevalence of foci of infection may be explained by well known facts of immunity, both natural and acquired. The natural defenses of the body due to the bactericidal and antitoxic powers of the tissues, blood plasma and cells especially the phagocytes protect us from infectious diseases both acute and chronic. Furthermore, when the animal body is invaded with pathogenic bacteria, the natural defenses are increased by their presence in the tissues and blood. Similar stimulation of the formation of protective antibodies may be induced in the host by the injection of nonlethal amounts of living bacteria or of dead pathogenic agents.

Bacteria may diminish in virulency and pathogenicity and exist as harmless parasites of the skin, mucous membrane and probably also in the existing foci of the tissues.

The immunity to infection from foci of infection to general and local disease may be partly or wholly broken down by the same causes noted in the discussion of the susceptibility to foci of infection. Exhaustion and debility from physical and mental overwork, starvation, chronic noninfectious general disease and exposure to wet and cold are important factors in the increased susceptibility to acute and chronic general disease from focal infection. It is also to be noted that poor body mechanics including faulty posture, defective functions of the respiratory organs, diminished blood pressure with poor circulation, defective general nutrition and other factors increase the susceptibility to systemic infection from a focal infection especially in the so-called chronic rheumatic disorders.

DIAGNOSIS OF THE FOCI OF INFECTION IN THE ETIOLOGIC RELATIONSHIP TO GENERAL DISEASE

In the diagnosis of the focus of infection related to a general disease, the first and very important step is to make a careful history of the patient's past and present complaints; a general examination should be made including if necessary, the aid of qualified medical and surgical specialists. With proper technic infected material may be obtained from the tissues containing the focus of infection which will permit of microscopic examination and the attempt to produce bacterial cultures.

When a systemic disease occurs which present day knowledge associates with a primary infectious focus, the site of the focus must be located. The character of the systemic disease may point to the most likely location of the primary portal of entrance. The primary site of acute rheumatic fever, endocarditis, glomerulo-nephritis, chronic atrophic arthritis, iritis, acute appendicitis and acute cholecystitis is usually located in infection of the jaws and teeth, acute or chronic tonsillitis and sinusitis. The cause of gonorrheal arthritis is usually located in the genitourinary tract.

EXAMPLES OF ACUTE GENERAL DISEASE DUE TO A FOCUS OF INFECTION

Rheumatic fever is most prevalent in the damp and cold season of the year; its incidence is greatest in the young and in the more exposed male of all ages. For many years clinical observation has noted a relationship of acute rheumatic fever to tonsillitis. An acute attack of tonsillitis may have occurred an indefinite number of days before the onset of the systemic disease. Acute rheumatic fever is undoubtedly caused by a strain of the streptococcus group of bacteria, but it is the consensus of opinion of clinicians and investigators that a specific strain of the streptococcus has not yet been identified. We may hope for the identification of a specific strain of the streptococcus causing acute rheumatic fever of the classical type as has been identified in erysipelas and in scarlet fever.

ACUTE GLOMERULO-NEPHRITIS

Acute glomerulo-nephritis usually develops without subjective symptoms. The objective signs are varying degrees of hematuria, albuminuria and cylindruria with infections about the teeth, jaws, tonsils or sinuses. If the removal of the foci of infection causing the infection is neglected, the kidney lesions may develop into chronic nephrosis.

ACUTE APPENDICITIS

Acute appendicitis due to hematogenous infection from a primary focus located in the jaws and teeth, more often in the faucial tonsil, and from other foci of infection in the head, has been noted by clinical observers in Germany, France and the United States. Cannon (4) states that appendicitis and cholecystitis are of hematogenous origin. He emphasizes the opinion that typhoid cholecystitis occurs hematogenously. Adrian (5) cites clinical observation of tonsillitis and throat infections which he describes as angina associated with appendicitis. He calls attention to the similarity in histology of the lymphoid structure of the tonsils and appendix, and gives this ana-

tomical similarity as a reason for the etiological relationship of angina to appendicitis. He coined the term "anginal appendicitis" to express this relationship.

SUBACUTE INFECTIVE ENDOCARDITIS

Subacute infective endocarditis was first described by H. Schottmüller (6) as endocarditis lenta caused by a green producing microorganism which he called *Streptococcus viridans*. The disease was described by Sir William Osler (7) and by F. Billings (1) and E. C. Rosenow (2) as chronic infectious endocarditis, by Thomas J. Horder (8) as infective endocarditis and by E. Libman and H. C. Celler (9) as subacute infective endocarditis. This latter name is now generally accepted.

The disease is recognized readily by a usually constant *Streptococcus viridans* bacteriemia, by petechiæ of the skin and mucous membrane, by fever of an intermittent type of low grade and by the usual local signs of endocarditis.

Occasionally it has been found to be due to a primary focus of infection especially about the roots of the teeth. It is characterized by an enormous growth of vegetations on the heart valves and endocardium entangling blood cells and thrombi. It is a condition of infection which affords an excellent example of the law propounded by William H. Welch in which the infectious microorganisms immunize themselves against the antibodies and other protective agents of the host. The disease is usually fatal.

EXAMPLES OF CHRONIC GENERAL AND LOCAL DISEASE DUE TO PRIMARY AND SECONDARY FOCI OF INFECTION

CHRONIC CHOLECYSTITIS

Chronic cholecystitis with or without gallstones, is as a rule the result of acute infection of hematogenous origin.

Chronic infectious cholecystitis is of importance because of the discomfort it may cause and its interference with the function of digestion. It is quite as important as a secondary focus of infection causing general disease. This

infection may lead to biliary cholangitis evidenced by the long known entity hepatic intermittent fever; to degenerative changes in the heart muscle and kidneys; to types of perineuritis and other conditions. The surgical eradication of the infection is usually followed rapidly by the disappearance of the intermittent fever, the restoration of the heart muscle tone, a disappearance of the evidence of kidney degeneration and relief from the uncomfortable lameness due to perineuritis.

CHRONIC INFECTIOUS ARTHRITIS

Chronic arthritis is classified as an atrophic form and as an hypertrophic type. Chronic arthritis is widely disseminated, the atrophic type occurring in the young to middle age and the hypertrophic type in those beyond middle age. It is important because of its crippling results and discomforts and also because of the great economic loss which it entails.

After long study, the American Committee for the Control of Rheumatism, its members composed of clinicians and investigators whom we all respect, has issued an opinion concerning the disease commonly known as chronic rheumatism or chronic arthritis. The Committee is of the opinion that hypertrophic arthritis is not of infectious origin, but that atrophic arthritis is an infectious type of the disease. The opinion is given that no one strain of the streptococcus or of other bacteria has been discovered as a specific etiologic factor.

This report of the Committee has been published in an essay by Osgood (10) of Boston. In this paper Osgood gives a clear, comprehensive and satisfactory description of hypertrophic arthritis and also of atrophic arthritis or chronic rheumatism, which I recommend should be read by all members of the profession interested in the subject.

The members of the American Committee for the Control of Rheumatism individually and as a committee, believe apparently that much of the morbid anatomy and resulting dysfunction which occurs in the joints, muscles

and tendons of atrophic arthritis, is due to the diminished blood circulation of the involved tissues. With this opinion I agree and direct attention to statements I have made in former publications and in this paper to the probability that hematogenous infection by bacterial emboli or their toxins is a large factor in the diminution of the blood circulation especially in the smaller blood vessels.

In the treatment of the condition it is interesting to note that at the Mayo Clinic lumbar sympathectomy has restored a liberal blood circulation to the lower extremities of patients suffering with atrophic arthritis with phenomenal restoration of function of joints and muscles and great favorable changes in the morbid anatomy of the affected parts.

GONORRHEAL ARTHRITIS

Gonorrheal arthritis is a classical demonstration of general disease from a focus of infection. It may be acute or chronic. The focus is usually in the seminal vesicles or in the infected thrombi and veins about the base of the bladder. The gonococcus seems to exist as a virulent pyogenic type and also as a strain much less virulent and nonpyogenic. In the pyogenic type of arthritis, joints and tendon sheaths may be involved. Early surgical drainage is necessary. Associated with acute gonorrheal arthritis may be a gonococcemia which may exist also in the absence of arthritis and the further development of a malignant type of endocarditis.

In the chronic type of gonorrheal arthritis the joint exudate is usually serofibrinous, involves the knee joint by preference, may attack other joints including the temporo-maxillary and the sternoclavicular. The disease is usually very painful and associated with marked disability. Removal of the focus of infection surgically when necessary, or by massage of the seminal vesicles and other local tissues followed by a proper after care will usually result in cure.

ANAPHYLAXIS

In addition to general disease, a focus of infection may excite the condition known as anaphylaxis or allergy.

It has been suggested that the bacteria proteins or the split products thereof of the infectious microorganisms of the focus of infection may be absorbed parenterally through the blood stream and as a formed protein sensitize the body cells by the formation of specific antibodies within eight or ten days, after which a further absorption of the bacterial protein may excite the well known phenomena of anaphylaxis. Among the clinical phenomena produced by this type of anaphylaxis, a form of bronchial asthma may occur. S. J. Meltzer (11), V. C. Vaughan (12) and other investigators and clinicians have expressed the opinion that some types of bronchial asthma may occur from the parenteral absorption of bacterial proteins and other forms of albumins. I have observed complete relief of this type of bronchial asthma by the eradication of the offending focus of infection.

PREVENTION AND TREATMENT OF FOCI OF INFECTION

Prevention of foci of infection is important and should embrace the removal or eradication of the causes which increase the susceptibility to focal infection. The conditions which increase the susceptibility to focal infection have been mentioned and all of them are important and should be corrected if that is possible.

Attention should be given to foci of infection when they are recognized and especially in the jaws, teeth and throats of children, before general disease occurs. But in this work and also in the eradication of foci of infection when the general disease is present, common sense should be the guide.

I regret to say that too often through superficial examination, failure to apply rational principles and poor judgment, teeth and tonsils are needlessly sacrificed, often to the detriment of the patient's health. We all know that

in some instances a crusade of tooth extraction of teeth at all ages and of tonsillectomy in children has been carried on in some communities with the object of promoting the present and future health of children and adults. We are not all in accord with the wisdom of such an undertaking.

The subject of focal infection causing general and local disease needs continued clinical observation and research which will, I believe, correct the mistakes of the past and present in the diagnosis and treatment of the condition, and lead to a more efficient knowledge of the subject which is so important as a fundamental pathological principle.

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MEDICAL EDUCATION AND MEDICAL PRACTICE*

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I am fully cognizant of the honor you have conferred upon me by inviting me to address you. Indeed I regard your kind invitation as another symbol of the very cordial relations that exist, and, I feel sure, will always exist between McGill University and your distinguished Academy of Medicine, between scientific men throughout the English speaking countries of the world, and, more especially, between the British Commonwealth and this great Republic.

Already you have greatly strengthened the bond of friendship with McGill University through the election to your Honorary Fellowship of Professor Edward Archibald, one of Canada's most distinguished surgeons. Be assured that his admission into your eminent company has not passed unnoticed by his colleagues at home.

You have asked me to speak on "The Continued Education of the Practitioner." I do not know whether this title applies to post-graduate education in general or to that which is of benefit chiefly to the study of focal infections. In any case the subject of this symposium may well serve as a text for any discussion on medical education. The wide distribution of focal infections and their protean manifestations afford many and varied opportunities for study in both diagnosis and treatment of disease, and I shall have pleasure later on in briefly discussing the relation of postgraduate study to some of these fields. Public exploitation of one's views on medical education should perhaps be avoided, like the plague, and since last June, when in thoughtless haste I accepted your cordial and irresistible invitation, I have had abundance of leisure in which to repent of its acceptance.

*Delivered October 20, 1930.

Despite the undoubted progress attained in medical education many of its problems seem as insoluble as ever. The impression still obtains that all is not well with our medical schools, that the mass production, though improving, is yet far from the ideal, that the method of training, to be sound, must be further improved.

On the other hand, any *single* system for the education of physicians is bound to fail, because no two physicians start from the same base line, any more than two students when they enter on the study of medicine.

It is for this reason that the continued education of the physician cannot be severed from that of the medical student, nor from his pre-medical training.

Let us, therefore, as an introductory thought, consider briefly the subject of early school and college education.

THE PREPARATORY SCHOOL

Among the critics of existing conditions are those who point a finger of scorn at the *preparatory schools* and colleges, where, they claim, the laxity of discipline and want of respect for authority is all too apparent in the pupils. There can be no doubt that much is still left to be desired for a better personnel among the teachers in our schools and a greater appreciation of the dignity and importance of that office. If this criticism be sound, such a free and easy system stands in strange contrast to the inflexible rigid requirements of the university, as set down in our curricula of medical training. The insidious influence in the university of what has well been termed "syllabitis," has been all too fruitful of waste and misdirected energy.

In Europe it is the reverse; there the free and easy methods permitted in the universities form a striking antithesis to the rigid discipline of the gymnasium and of the *école normale*.

THE PRE-MEDICAL COLLEGE TRAINING

Even if it be granted that here in North America all men are born equal, the fact is that they do not remain equal for any length of time. Some have the advantage of means, leisure, discipline, good schools, good masters and that indefinable advantage that comes from birth and breeding, besides that more obscure quality personal to each individual and inherent in himself alone. On the other hand, large numbers go through life handicapped in one or more of these privileges.

A striking feature of our modern system lies in the fact that medical education has, unfortunately, become far too much a thing apart. Upon the average college boy, who contemplates the study of medicine, is imposed a modicum of scientific subjects, which, in the short time at his disposal, he can learn only superficially, and that, too often at the sacrifice of cultural training. Despite the recent polemic of a distinguished surgeon denouncing as unnecessary a broad general education, one can only deplore its widespread absence. A university training, assuming it is worthy of the name, makes each part of the curriculum contribute something to the mental discipline and training of the student. Without it, life has a less dignified ambition and less expansive horizon.

I ask you for example, whether or not the lack of some classical training to the student of anatomy does not make its study a difficult feat of memory in nomenclature rather than a discipline in thinking and observation? The derivation and significance of the strange anatomical terms, he cannot appreciate. Is it, I would ask, our lower standards or the too specialized training that explain the obvious defects in his knowledge of English, its composition, its expression, and even its spelling, not to mention what is politely called his "conversation." A reading knowledge of some modern foreign language is similarly a requirement more honored in the breach than in the observance. To personality and character, breeding and the humanities, so fundamentally essential to the professional

man, greater attention may reasonably be directed, and opportunities afforded to cultivate these as an integral part of pre-medical training.

Undoubtedly, a great forward step was taken when the numbers entering the medical school were limited and a selection from among many was made possible. This limitation is essential to the maintenance of ideals and, to some extent at least, eliminates the really undesirable candidate. In this matter the Association of American Colleges has assumed a leadership of which it may well be proud, for standards have thus been raised and a definite degree of knowledge, at least on paper, has been exacted.

Let me merely emphasize again that upon the subject of preliminary college training as a matriculation standard for medicine, authorities are not all agreed—doubtful whether more of science, on the one hand, or of classics, literature and languages, on the other, is desirable.

THE MEDICAL STUDENT

And now, the candidates come to the medical school, unequal in ability, unequal in training, unequal in capacity for work, differing in their predilections for study, yet are their certificates the same—tiresome in their uniformity—acquired after several years of labor.

Many students bring something more—they have already acquired academic degrees of various kinds in arts, science or philosophy. At McGill 86 per cent are so qualified, and in some schools the possession of the degree is obligatory. With the increasing pressure on medical schools there is little certainty that a student will be admitted unless he bring with him a bachelor's degree, and yet, so hampered are we by traditions that we compel all students, irrespective of their education, quality or experience, to follow an identical course for four or five years, after which they graduate, and still all, presumably, alike.

We are, I believe, all agreed that many students—be their credentials what they may—do not yet know how to

learn, how to observe or how to think. If, in his college course, he has concentrated his attention on the sciences—whereby he may learn by the experimental method how to think and observe—if he has used this method as his chief source of training, and thereby become efficient through so called self-education, he will in all probability have acquired his knowledge at the sacrifice of general knowledge and breadth of learning.

The generally accepted opinion of this country seems to be that students learn more through the laboratory by experiment and when left to their own resources, than they do in the lecture room or the clinic. For this reason, students are encouraged in research, and the better ones are segregated from those of average standing. If by research we simply mean the attitude of mind which every student should adopt, wherever his work may be, it is, after all, but another name for training in observation and judgment, no matter which line of work he may care to select.

The trouble is that the experimental method for the average student wastes too much time. Let the average student rather believe what the professor *tells* him—that there are 3600 seconds in an hour, instead of counting by the clock *for* an hour.

The average students, for the most part, have neither the desire nor the capacity to profit by the purely experimental method. In Europe they appraise more justly—in Germany only 3 per cent of students attain to eminence, in France 10 per cent, while in England 70 per cent never pass above the lowest grade for license, although every facility is at their disposal.

But, you will say, is it not often that the average men develop under the stimulus of experimental work, and that often a genius is uncovered? While this may apply to the exceptional case, it can never be considered the rule. And, in the preparation of students for the practice of medicine, it is not well that the one genius repentant sinner should take precedence of the ninety and nine who seek entrance into the kingdom of Esculapius.

LIBERTY OF CHOICE

In our effort to teach enough, we offer more than can be absorbed—without this elemental minimum there is little time left for freedom of choice.

It is not difficult to obtain an overwhelming majority in favour of liberty in higher education, and, as Dr. George Vincent intimated long ago, it is somewhat of a reflection on this profession in America if we are obliged to confess that our students are neither prepared for, or worthy of, more latitude in study.

Nothing can be more ludicrous than to compare the curricula of different schools with respect to the importance attached to individual subjects, by the number of hours considered essential for the training. This wide variance in itself is ample proof of our unsettled views, and is further sufficient evidence in favor of the elective system. It is not good, of course, that all schools should be so standardized, nor that a student should proceed in lock step from class to class. Let the student, the unwilling victim of a "syllabitis," as it has well been called, work at a speed to suit himself, conforming only to the rules and regulations of the department, and controlled by the examination system of the university. Three general examinations alone should be necessary—one at entrance, one for the combined preclinical sciences, as in Edinburgh, and a final one to determine broadly his general fitness to practise his profession. Such examinations should test a student's knowledge and what he can do with the knowledge he possesses, rather than the facts he may have acquired. Such were the views of Franklin Mall. Course examinations are things to be deprecated—evidence not of knowledge and understanding, but of an ability to cram facts in a given space of time.

European students on entrance know fewer things than ours do, but they are better educated, more alert to find their way, more personally responsible, and, therefore, more free to choose to work their way *back* into subjects necessary to the understanding of a case.

The French student enters the wards on the first day. He comes into immediate contact with patients. He discovers that anatomy, physiology and pathology *may* be useful to him. Laboratories are open to him, where he can learn as much or as little as he likes, but always in the light of the patient.

Sir Andrew Macphail's complaint is that here on this continent we have allowed ourselves to become slaves to a system which is now outworn and alien to us.

The German student has entire freedom to move from university to university, where he thinks he can obtain the best teaching, which leads to emulation among the teachers. I am prepared to admit, however, that the German student is not always moved by the abstract desire for education. Too often he goes to a more genial climate, to a university where he knows the examination is easy, to a place where the society, the music, and even the quality of the beer, is entirely to his taste.

The English student is still an apprentice to a teacher.

But the French system, even with its model institutes for scientific study, is not for us. Its disadvantages come from the complete severance of university and hospital, and the examinations which terminate only with death.

Nor is the German system, with its professors ordinarii, extraordinarii and honorary—its famuli and private doctors—even though for clinical study it is almost supreme.

I should like to see in our better schools, courses offered as freely as possible, to be taken when and where the student chooses. Courses of no value would then soon die a natural death. Demand and supply, competitive teaching and the inspiration of the individual professors will readily determine the method of suppressing either a poor student or a poor instructor.

It is high time that we boldly abandon the rigidity of our system, define the minimum work for each student—considering always his aim and whether his aspirations

lead him to practice, to specialism, to science or teaching. A return to the shorter period of study would soon result—a four years' course of nine months, or even a three years' course of eleven months each, with the added year of a guided hospital service. With an elective system in the better schools, and an honor's course throughout for students with academic ambitions and ideals, the path is well defined.

THE PHYSICIAN

Each country has its peculiar needs, but the need of humanity is an universal one, namely, to supply the physician, who will at most not be a menace to the community. After that comes the specialist, the scientist, the teacher.

There seem to be two rather contradictory opinions current among those who theorize on medical practice. The British teaching places diagnosis, by means of clinical observation, very high in the scale of medical duties, while the second method called by Herringham the "encyclopædic," demands not the formation of judgment on a case, but its suspense, and holds that function most high. Diagnosis is, in a sense, made a secondary thing, an object possibly of distant hope, like a future life, but not a thing to guide our action in the present.

The first thing deemed necessary is a complete and detailed study of the patient's state, so thorough that no cell remains unturned. As a rule the diagnosis is arrived at from documents furnished by a syndicate of special examiners—chiefly from the laboratories—and it may sometimes happen that the patient's untimely death renders null and void the incomplete though magnificent attempt. In the former case, where observation of the patient is utilized to its fullest limit, one tries, without jumping to any unreasonable conclusion, to make up one's mind on the diagnosis, and to make the best efforts of which the rude mind is capable, and which may be called common sense.

Now, I do not for a moment decry the laboratory aids—

far from it. To state in detail the enormous advantages that have accrued from careful analytical processes now available to the practitioner would be to write a large part of recent medical history. Yet the gain is not an unqualified one, for with it comes a new danger, viz., that the last word in the individual case is with the laboratory worker. But the patient remains, and ever should remain, the central feature of the problem. It is at the bedside—not in the laboratory—that the decision of the issue must be taken. In other words, laboratory methods should be used to enlarge, not to contract the area of personal observation cultivated by the practitioner.

THE TEACHER

Leadership in clinical teaching should be in the hands of men whose chief concern is the care of hospital and dispensary patients, the teaching of students, as well as the prosecution of research, and this combination is, I believe, struggling, more or less, successfully for recognition.

It is, I believe, scarcely recognised in medical education that the science and art of teaching is a special calling. The average professor of clinical subjects is far too much engaged with his daily routine to devote himself as an expert in pedagogy to the teaching of medical students.

It is interesting to read in Hawthorne's delightful medical essays his views on education, more especially with reference to the systematic lecture. "Practical instruction in the laboratories and in the hospital," he says, "has occupied an ever growing place in the curriculum, and in many schools the systematic lecture has failed to hold its own."

If the sole, or even the main, purpose of the lecture is to convey information, little can be said for the persistence of the lecturing system, and the purpose may be more successfully attained by the printed book. Books abound and some are good, and many cheap.

All the information which a teacher has to convey may

be presented on the printed page, with tricks of type and paragraph, apt for emphasis and for orderly perspective. Diagrams and illustrations add further values, and so it is argued it is the book and not the lecture that should be the modern educational instrument. The lecture survives by force of precedent and tradition, and the student would be better occupied in his study and the professor in his library and workshop. Such is the indictment urged against the lecture as a teaching method.

Candour compels an acknowledgment of the existence of lecturers who appear to forget that in an age of cheap printing, some achievement, other than the mere recital of facts, is necessary to justify their existence. They continue the ancient tradition, as out of date as witchcraft, and where the place of the principal performer could be effectively taken by the gramophone.

But the object of education is not solely the implanting of facts in the student's brain and memory. Teaching, or education, is much broader in its scope. Its purpose is not merely to inform the mind, but to develop and strengthen it, to cultivate habits of thought, reasoning and mental order, and to encourage a capacity for judgment for the weighing of evidence and for a broad and balanced outlook.

The ordered presentation of knowledge afforded by the book is, of course, the ground work of the student's equipment, but its framework is severe, inelastic, unemotional and is apt to present a somewhat forbidding front. It is only the exceptional writer who is able to confer on the technical textbook the qualities that excite an appetite for learning and provide the glow of enthusiasm and the need of human interest. Such were the textbooks of Hilton Fagge in medicine and of Erichsen in surgery.

If the profession is to be recruited from men of high mental calibre, ability and wide sympathies, there must be provided in medical life and training, not only the means of livelihood and an opportunity for craftsmanship, but

likewise those subjective influences which contribute to mental growth and development.

Systematic lectures should be an agreeable interlude of laboratory and ward work, a mental recreation and stimulus in which the personality and the character of the teacher—perhaps more even than the facts presented—leave an indelible impress on the student's mind.

I see signs on every hand that this system of ours is breaking down. The universities are demanding freedom, freedom to develop their own ideas, to apply their endowments, their prestige and facilities to the best general advantage.

To that end your Commission on medical education has rendered an inestimable service by placing before the profession a complete conspectus of medical education in Europe. The Director, Dr. Rappleye, has made an exhaustive survey of the methods in eight European countries. I am far from saying that we should copy any one, but we can learn much. Possibly, we can learn most from England of freedom and competence, where all secure a training suitable for the general practitioner, and those who aspire to something more may qualify for the highest posts. In England there are 23 licensing bodies and 33 medical schools. No medical school attached to a hospital examines the student. They go when and where they like to be examined by such licensing body as best seems to meet their capacity and their future career. Their teachers do not burden their conscience with the learning or the passing of the students, but the good teacher is sure of a following. He teaches all the better because he does not examine and the students are friends and not enemies.

THE GRADUATE

But, you will ask, what about the continued education of the practitioner, which, after all, was to have been the main theme of my message. I have already explained in extenuation of this long dissertation that one cannot well

dissever graduate teaching from the antecedent training. According to his special preliminary advantages of birth, training and opportunities, so will the graduate be guided in his later career.

Modern medicine has been demanding more and more access to laboratories and hospitals, which is essential to the growth and maintenance of professional power. The great majority of physicians, however, have had too little contact with these agencies, and relatively few take full advantage of the opportunity.

Continuation courses for practitioners represent a need in medical education worthy of very careful consideration. The clinical resources of a great city in a university setting alone offer an opportunity for the organization of graduate teaching. The success, however, depends as much on the segregation of the graduate students as it does upon the teacher.

Mass training in postgraduate work in detail is certainly not feasible, though much may be done with large groups to maintain their interest, to instruct and to entertain, and this can be done by lectures, clinics and demonstrations.

The graduate who comes, little knowing what he wants to receive, gains little except in a general way. Essential to the success of postgraduate teaching is proper segregation of the pupils. The younger graduate and the older, for example, must be treated on a different basis, for, in the effort to provide instruction, one is confronted by the problem of satisfying the needs of a variety of physicians of different tastes.

The ideal system, were it feasible, is that of an apprenticeship—the personal contact of the graduate with a master's mind, the sustained association with intellects that have better qualities and ambitions than his own.

THE RECENT GRADUATE

To the recent graduate comes either the opportunity for an academic career, a specialty, or both, or, again, the lure of general practice; and, according to his lights, so will the younger man select his path of advancement.

With respect to him who chooses an academic career, or a specialty, one cannot lose sight of the broadening of the science of medicine in the biological sense with the increasing tendency to include the pre-clinical sciences of the medical curriculum in the general university cultural program. All this has its bearing on future graduate study. Physiology, pathology, anatomy and even pharmacology are now open to students in our arts faculties and general college courses, and so men are encouraged to enter the study of pure sciences as a career.

Progress has been rapid in the science of living beings, their functions and disorders, and has so influenced the social, intellectual and material conditions of mankind that medical research of this type has bulked large in graduate study—assuredly this is all to the good.

It is this influence, moreover, as I have already hinted, that has guided so much the educational policy of the medical school, both graduate and under-graduate, with respect to the experimental method. For graduate study, leading to a purely scientific or academic career in medicine, nothing could excel it.

But, I would submit that this does not necessarily lead to the best type of practitioners of medicine, either general or special, and I still contend that for the recent graduate student, who is anxious to develop into a scientific practitioner, such absorbing scientific study may be overdone at the expense of skilled training in the clinical field. The practical study of the patient in the dispensary, in the wards and in the operating room, is of paramount importance to those who aim at the best type of clinical practice. So long as they train themselves to think logically and to observe accurately at the bedside, they can

learn an equally useful scientific attitude in similar fashion as they have already observed in the use of the microscope and the test tube.

This has been the Canadian attitude ever since clinical medicine began to be taught. Bedside observation and recording have always been compulsory for students in their later years.

It was this technique that Osler learned at McGill. McGill and the ancient University of Pennsylvania had inherited it from Edinburgh, which in turn took it from Leyden. It was Osler who introduced it elsewhere as he travelled.

THE SPECIALIST

It is a common practice on this continent for the recent graduate, desiring to become a specialist, to proceed after a very short internship in hospital at once into his chosen circumscribed sphere of work. This enables him to develop a technical skill and knowledge of no mean sort within a few years after he has left his university. Splendid opportunities of the kind are offered in many of our educational centres.

The graduate, however, enters upon his specialty, often without a preliminary general experience and medical training, not to mention an adequate knowledge of the humanities of general practice. It is the short cut tendency of our times, and our best students readily acquire the habit and are encouraged so to do, even by the presentation of scholarships to that end. The product, too, is often better than we suppose.

But, may not one question whether such a custom develops the most representative type in our profession? Does it ensure a continuance of succession to the great Titans of medicine, as were Sydenham and Louis, Gower and Allbutt and Osler, Billroth and Nothnagel, and the like? Should we not rather encourage the élite of our profession, who have the divine creative spark, to develop breadth as they become illustrious, culture as they become

distinguished, well informed on many sides, while they have the opportunity to rise as specialists in their particular chosen field?

Once entrenched behind an adequate preliminary general knowledge, a relatively modest intellectual effort is sufficient to hold one's ground. This is the truer, the more important and elevated the position that one has captured.

THE OLDER GRADUATE

And what may one say for the continued education of the older practitioner—for him who absorbed in years of general practice has been allowed too little leisure for keeping abreast of medical progress—the pilgrim, who has awakened to a desire to change for a brief period the depressing atmosphere of the Valley of Humiliation for the stimulating triumphs of the Delectable Mountain of Knowledge? The answer is not so easy. Medical science has become so vast, so dependent on the biological sciences, and so highly specialized in every direction and the individual spheres of knowledge have become so interdependent, that a choice is difficult for him who seeks to gain a refreshment where progress has been so appallingly rapid.

Apart from the opportunities of wards and dispensaries, he will be confronted with the choice of study in laboratory technique, in highly specialized courses in serology, radiology or any of the similar advanced subjects of postgraduate study.

In his effort, for example, to study focal sources of infection he may learn to differentiate a normal from an abnormal dental condition, mere absorption from focal abscess of the teeth. He may even transilluminate, with some degree of skill, the sinus cavities, or detect an abnormal shadow in the actinogram. If more ambitious and lucky in his technique, he may acquire some dexterity in the newer methods of examination of the gall bladder, and even study the pyelograms of the normal and abnormal kidney, and he may familiarize himself with the diagnostic

study of cerebrospinal fluids, or learn bacteriologically the various types of pneumonia.

In such short courses, however, without the preliminary and more prolonged fundamental training he will not only fall short in manipulative skill but fail to appreciate the relative values of what he learns to see. Without experience and judgment he cannot expect to go very far, and there is no short cut to such an achievement.

There pours into these graduate, or "refresher," courses, as they are called, a number of men, each with individual ambitions and ideals, and each with a different zeal for knowledge. Each is staggered at the choice, uncertain how best to use his time. The danger lies in wanting to learn too much, in wanting to taste too many of the intellectual savouries of the banquet. He is apt to do as so many have done before him in Vienna and avail himself of so many courses that, at the end of his short weeks of study, he suffers from intellectual indigestion. Far better would it be for such a one to curb his ambitions, confine himself to the reasonable, restrict his interests to a limited sphere and by attaching himself to one service, or one teacher, whom he respects, and allow his mind to gain inspiration, knowledge, and a degree of judicial discrimination.

It surely is a joy to return to some great teacher who can urge to better things. After all, apart from this, what more can he expect to receive in so limited a time—a few tags of information, or some technical skill in a circumscribed field, or special tips on diagnosis or treatment.

But, these refresher courses should, in reality, do more. They should inspire while they inform. For, just as there is always a refreshment of knowledge and awakening of that renewed activity of mind that we call keenness, so should there also be an adjustment of outlook and an urge for higher ideals of work. Herein lie the great advantages of this Academy Fortnight—an unusual opportunity to accumulate experiences and inspiration, to acquire new insight into the progress of medical science and added skill in technical procedure.

Of further advantage, moreover, is it for those far from medical centres to come into the enlightening atmosphere of the Academy and therein to enjoy the fellowship of its distinguished members.

We in Canada, in addition to the usual graduate facilities, have adopted a procedure somewhat the reverse, viz., we select from our university staffs duly qualified teachers to visit the rural districts and endeavor to acquaint the physicians therein with the latest advances in knowledge.

There is one danger, obvious to all, lest in the limited training thus acquired the inexperienced practitioner gains some false sense of security from the newly acquired information (more especially in surgery) which he carries to the bedside of the individual sufferer.

The already trained surgeon may get useful information on operative technique; the practised internist may acquire added skill in certain highly specialized procedures of medical diagnosis, but to him who is untrained to carry to a useful conclusion these practices, with both discretion and judgment, a limited knowledge may become a menace to the public.

Mass production in higher types of graduate courses is virtually impossible, though the clinic, the demonstration and the lecture afford wonderful opportunities for inspiration and delight.

The British proposal to open a large new hospital with wards and laboratories solely for graduate study at the bedside, under the guidance of selected teachers, may prove satisfactory for the graduate of long standing. It is intended thereby to offer not only facilities for enlarging their clinical experience, but with added opportunities for observation and thought to afford a comparatively easy method of acquiring information and a new outlook.

But I have wandered too long and too far. For the practitioner there is only one means of acquiring continued education in the full sense of that term, and, from my own immediate observation, such an opportunity is being provided in some of your greater institutions.

A sufficient time, however, must be devoted to a given topic. In order that a detailed study in any branch of work may be of permanent value, at least six months should be reserved for it. A service devoted to such instruction under an authoritative guide, willing and able to impart and inspire, means much. The day of the separate postgraduate school is at hand. It should be an integral part of those few larger institutions, adequately equipped, and with a staff and prestige, to afford such facilities. Nothing is more lamentable than the half-baked graduate course offered by such schools that have neither personnel nor facilities.

For those who are willing to spend longer time—one, two or three years—opportunities for higher degrees might well be added. Internships, or staff appointments, with participation in the service, and not mere observation of others, offer to a man the practical work in which he is to become skilled.

I have but recently learned of a project here in New York that may well commend itself to those local practitioners seeking further knowledge in their special line of work—a program by which half of their day is devoted to a serious and systematic study in a given clinical field—over a period of three years—while during the remainder of their day they may continue as breadwinners in their private practice. The special course to which I make reference deals with surgery, but to this limited group encouragement is given to study, not alone in the operating room and wards, but in the laboratories of pathology, physiology and anatomy.

Great advances have already been made in postgraduate work and still greater are being developed. Nowhere is there a better chance than on this great continent, where educational conditions are untrammelled by the viscosity of conservative tradition—unimpeded through inadequate funds—and where keen progressive intellects and exceptional facilities abound on all sides.

ACUTE HEMATOGENOUS OSTEOMYELITIS *

Its pathology, with special reference to the involvement of joints, its diagnosis and the present day concepts of treatment.

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There are few diseases of childhood which are more serious in their outcome than acute hematogenous osteomyelitis. Death, recurring attacks or permanent disabling deformities may follow its onset; consequently, its appearance is looked upon with apprehension. Because of the tendency to recurring attacks, the phrase "once infected always infected" has been applied to it.

Though the outlook, in many cases, is poor, a larger number of favorable results are now obtained than were formerly, due to the more rational treatment which has been developed. Because of this, fewer lives are lost, there is a decreasing number of patients with recurring attacks and there are fewer individuals with permanent disabilities.

The intelligent treatment of an infection of a bone is dependent upon a knowledge of the pathological changes which may occur during the disease. To obtain the best results, the treatment must be applied at the earliest possible period in the course of the disease. The surgeon is often unduly criticized for a poor result when he is not to blame, as his care of the patient did not commence until the osteomyelitis had developed into an advanced stage. Consequently, early recognition of the condition is essential; this most frequently lies in the hands of the pediatrician or "general practitioner." The local symptoms by which the diagnosis is reached can only be understood through a study of the pathological changes in the bone, as the diagnosis at this stage of the disease is dependent upon the presence of but a few signs. Therefore, it seems

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wise to refresh our memory of the important pathological changes which occur.

Acute hematogenous osteomyelitis, at first, is an infection of the medulla of the metaphysis and, in the later stages, of all the tissues of the bone; the microorganisms having been brought to the metaphysis through the circulation. It is evident that such a lesion must be preceded by a bacteriemia, the bacteria having entered the blood stream through a portal of entry upon the body surface. Ordinarily, a bacteriemia is considered as a condition in which the bacteria remain in the blood stream continuously for a period of time and can be demonstrated by means of a culture. Though this occasionally occurs, it is not always possible to isolate bacteria from the blood at this period of the disease, either because the methods which are in use are inefficient in detecting them, or that they are but transiently in the circulation. Following the onset of the local bony lesion, bacteria may again enter the blood stream from this focus, producing metastatic lesions, which frequently occur in the bones, though occasionally, other tissues may become involved.

The disease varies in its intensity from a mild type of case with a well localized focus, to one in which there is a general blood infection accompanied by symptoms which over-shadow in intensity those of the local bony lesion. In this latter type of case, there is a general sepsis and from the blood of these patients, the infecting microorganism can usually be recovered by culture. Though in most cases, the local lesion is frankly suppurative from the time of its inception, occasionally one may be observed in which pus formation is not a prominent feature. These variations in the onset and course of the disease are due to different factors, among which may be mentioned the type and virulence of the infecting microorganisms, the amount of resistance of the tissues of the individual and the specific bone of the body which is involved, as well as the position of the lesion within it.

It is well known that acute hematogenous osteomyelitis

is a disease peculiarly confined to that period of life in which the bones of the body are undergoing their growth and that the lesion usually occurs in that part of the bone which is actively engaged in the production of growth. Though children between the sixth and thirteenth years of life are most often affected, it is not uncommon to discover the disease in younger or older individuals. A baby, ten days old, was admitted to the Children's Surgical Service at Bellevue Hospital, with a suppurative arthritis of the knee joint which proved to be the result of an osteomyelitis of the lower end of the femur, due to a bacteriemia from an infection of the umbilicus. Occasionally, individuals in the third decade of life develop typical foci.

The *Staphylococcus pyogenes aureus* causes seventy-five per cent of the cases of acute hematogenous osteomyelitis; this organism is found upon the surface of the skin of every individual and is the cause of the majority of the lesions of surface infections, such as furunculosis, impetigo and inflamed scratches and abrasions. Some one of these lesions usually acts as the portal of entry for the staphylococcus to reach the circulation, though often it is so small and insignificant that the actual focus is not discovered at examination. Apparently the staphylococcus remains but transiently in the blood stream, for if staphylococci are injected into the veins of a young rabbit, the microorganisms soon disappear from the circulation and after death are found in large numbers in the marrow cavities of the long bones. Apparently staphylococci behave in a similar manner in the human being, as the organism is demonstrated but temporarily in the blood stream.

Streptococci usually enter the circulation through the mucous membrane of the respiratory tract and remain in it for a longer period of time than do the staphylococci, for they appear to propagate in the blood. This organism can often be demonstrated to be in the circulation, by means of blood culture, over a period of weeks and even months. If this infection becomes localized, it is more apt to form its focus upon a serous surface or in the soft

tissues than within a bone. Only about a tenth of the cases of osteomyelitis are due to it.

In a few cases, the pneumococcus is the cause of the osteomyelitis, the bone focus often following a primary lesion in another part of the body.

Trauma is probably the predisposing element which determines the position of the bony lesion. Some accident, producing a slight injury to the bone, precedes the onset of the disease in at least sixty per cent of the cases. The trauma is apparently of a type that causes a twisting motion to the bone.

Boys are more often attacked by this disease than are girls. This is explained by the fact that the former are more subject to accidents than are the latter; first, that type of accident which produces cuts or abrasions on the surface of the skin, which may later become infected and act as a portal of entry and secondly, that type which may produce a bony injury which will determine the position of the osteomyelitis.

The bones of the lower extremities are involved three times as often as those of the upper because they are more exposed to trauma. The flat cap-like epiphyses of the lower end of the femur, upper end of the tibia, upper end of the humerus and lower end of the radius, are more easily displaced, causing slight trauma to the juxta-epiphyseal region of the metaphysis, than are those better protected epiphyses on the opposite ends of these bones, consequently, the points of election for the inception of this disease are in the former metaphyses. The tibia and femur are frequently involved and the lesion is usually at the end of the bone which forms the knee-joint, as this region is particularly exposed to trauma. Though the long bones are most frequently involved by osteomyelitis, it is not uncommon to observe a case in which the disease has attacked a flat bone, as one of those of the pelvis or a bone of the hand or foot.

In the majority of cases, the infection arises in that

portion of the metaphysis which is in contact with the epiphyseal cartilage and from there rapidly spreads out to the subperiosteal space and down into the medulla or into the neighboring joint. Rarely, the epiphysis may become primarily involved, which is followed by a rapid extension of the infection into the joint. Primary foci which occasionally start in the shaft of the bone, usually develop within the compact cortical portion and are often of low intensity and remain localized.

There are many explanations for the relatively frequent involvement of the juxta-epiphyseal region of the metaphysis, among these being the peculiar anatomical arrangement of the blood vessels, which was pointed out twenty-five years ago by Lexer, but there are two other explanations which stand out as strong possibilities of being the cause of the frequent involvement of this part of the bone. The first of these is the apparent lack of resistance of the cancellous tissue of the metaphysis to the invasion of the *Staphylococcus aureus*. Robertson (*J. Bone & Joint Surg.*, 19:8-23, Jan. '27) discovered that the marrow cavities of the long bones of young rabbits, which were killed soon after staphylococci had been introduced into their circulation, contained large numbers of these organisms. He further found active phagocytosis occurring within the shaft and epiphysis of the bone, but on no occasion did he find leukocytes containing microorganisms within the metaphysis. This led him to believe that the tissues of the metaphysis were not as fully protected against bacterial invasion as those of the shaft and the epiphysis. The second factor which appears to determine the position of the lesion is the predisposition of the juxta-epiphyseal region of the metaphysis to injury; any motion of the epiphysis and its cartilage upon the metaphysis, to which it is merely held in contact by means of the periosteum, causes damage to the vessels of this region and consequently, a slight trauma may cause a hemorrhage within this part of the bone and allow organisms that may be present in the circulation, to enter tissue of lowered resistance. The occasional lesion that develops in the bone

of an adult is situated quite as often in the shaft as at the end of the bone.

The infection becomes established within the soft cancellous bone of the metaphysis as a localized suppurative process, but seldom remains so for long. Occasionally, the resistance of the tissues may wall it off and confine it to a limited area within the bone and later, a wall of compact bone is built up about it producing a cavity lined with sluggish granulation tissue and containing pus from which the bacteria may disappear. This may remain in a quiescent state for many years and is known as a Brodie's abscess. Instead of remaining localized to the metaphysis, the early focus more frequently spreads, following the path of least resistance within the metaphysis, which is along the epiphyseal line between the soft new bone of the juxta-epiphyseal region and the surface of the conjugal cartilage, to finally emerge at the periphery of the bone beneath the periosteum, producing a subperiosteal infection.

If the epiphyseal line at the point from which the exudate emerges is intracapsular, that is, the ligaments of the joint are attached to the metaphysis, rather than to the epiphysis, the infection perforates the cellular osteogenic layer of the periosteum and enters the joint cavity. In our experience, this is a common cause of suppurative arthritis in children. Primary infection of the synovia, from the blood stream, with the *Staphylococcus pyogenes aureus*, seldom occurs. Roentgenograms obtained sufficiently late in the course of the disease will often demonstrate small metaphyseal lesions in cases of this type. This is the common pathway for a metaphyseal infection to spread into a joint, as the avascular conjugal cartilage acts as a barrier to the direct involvement of the epiphysis during the early period of the disease. The occasional lesion that forms in the epiphysis also perforates, into the joint, at an early period, producing a suppurative arthritis. Later, in the course of the disease, the cartilage may disintegrate and the neighboring joint become involv-

ed by the infection spreading to the epiphysis and thence into the joint.

A subperiosteal abscess is formed when the point from which the pus makes its exit is extracapsular, the periosteum being stripped from the surface of the bone. The periosteum, under this condition is seldom perforated as the osteogenic layer is strengthened at this point by a tough fibrous layer which is continuous with the joint capsule. Previous to the formation of pus beneath it, the periosteum becomes congested and œdematous and is easily stripped from the surface of the bone, except at those points to which ligaments, fascial septa and muscles are attached. The periosteal vessels which enter the bone with the fibers of Sharpe, are damaged and the circumferential circulation of the bony cortex is destroyed. Though it is possible that the large medullary cavity, in the shaft of the bone, becomes involved by direct extension from the metaphysis, it is more probable that this involvement is brought about through the subperiosteal pathway as suggested by Starr (*Arch. Surg.*, 4:567-587, May '22), that is, the infection, having reached the subperiosteal space, travels down beneath the membrane and thence into the medullary cavity through the vessels of the cortex, by means of the haversian canals. This theory appears more tenable than that of direct extension within the bone, as the involvement occurs so rapidly that it is hard to conceive that an infection could break down the cancellous bone in the metaphysis in such a short period of time. Furthermore, secondary lesions often form within the medulla at the opposite end of a bone without involvement of the medullary cavity of the shaft; this can be explained as either metastatic in origin or due to an extension by means of the subperiosteal space. And finally, experience has taught us that further extension within the bone is not likely to occur, if an early lesion within the metaphysis ruptures into a joint or is drained. There is a rapid extension of the infection within the large marrow cavity following its involvement and this is accompanied by destruction to the circulation of the medulla. Later, the

infection may perforate the periosteum, enter the tissue planes of the soft parts and finally point beneath the skin.

The ultimate effect of suppuration, within the bone, is osseous death. This is due to an ischemia, the result of the destruction of the circulation. The blood supply of the diaphysis of a long bone is obtained from two sources, the nutrient and the periosteal arteries. The nutrient artery enters the medullary cavity of the shaft and divides into ascending and descending branches which distribute the circulation to either end of the bone. The periosteal arteries enter the cortex of the bone from the periosteum. The thick compact bone of the cortex of the shaft receives the blood from small vessels which enter it from both these systems. At the metaphysis, the periosteal vessels are larger and they perforate the thin cortex and anastomose freely with the branches from the medullary circulation. This arrangement of the arteries affords the bone a free blood supply by which a collateral circulation is easily established if one system is destroyed. Consequently, to produce a massive death or sequestration of a part of a bone, both systems to that part must be coincidentally damaged, the size of the sequestra being directly proportionate to the amount of damage which occurs. Certain bones of the body are subject to the formation of larger sequestra than are others. The entire shaft of the tibia may sequesterate, while a like occurrence in the femur is rare. This can be explained by the fact that the periosteum of the tibia is easily stripped from the cortex by the products of infection, as the bone is superficial and has few muscular attachments upon its surface, while the shaft of the femur has many muscles attached to it as well as an intramuscular septum which is adherent to the entire extent of the linear aspera.

Sequestration of an entire metaphysis is relatively rare and the fragments of bone which do separate from it are smaller than are those that sequesterate from the shaft; this is due to the ample blood supply of the former, as well as to the fact that its periosteum is not easily stripped be-

cause of the many muscular and ligamentous attachments upon its surface. The sequestration of an entire diaphysis of a bone is uncommon. When a shaft sequestrates, the separation occurs between the tubular portion and the cancellous bone of the metaphysis.

Shortly following the onset of the infection the body of the individual reacts by instituting processes to remove the dead tissue and replace it with new. The bone which has been depleted of its blood supply becomes separated from that which is alive by the action of phagocytes and new bone is formed upon the inner surface of the separated periosteum; this is known as the involucrum. The continuity of the damaged bone is usually renewed, through the formation of involucrum, by the time that the sequestrum has fully separated. If the involucrum fails to form, a loss of the continuity of the diaphysis may follow; this is the result of damage to the cells of the inner or osteogenic layer of the periosteum and follows in those advanced cases in which there has been a separation of the periosteum from the entire circumference of the shaft and in these cases the periosteum may be found to be sloughing.

Due to neglect, or through faulty operative technique, the epiphyseal cartilage may become damaged, allowing the infection to spread from the metaphysis directly to the epiphysis and finally into the joint. If the entire epiphyseal cartilage is destroyed, a premature bony union occurs between the epiphysis and metaphysis and growth ceases at this end of the bone. This results in a shortening of the limb, when the involved bone is single, as in the case of the humerus or femur, but causes disabling deformities if it be one of a pair, as in those of the forearm or leg. More often slight injuries to the cartilage occur which merely result in a retardation of growth.

In the milder types of case, the osteogenic function of the epiphysis may be stimulated, producing an increase of the longitudinal growth; this over-growth may amount to as much as an inch.

A pathological fracture may occur during the period of bone destruction, before sufficient involucrum has formed, or later, because of insufficient formation of involucrum. Fractures at the end of the bone occur earlier in the course of the disease than do those of the shaft. The former are frequently the result of an attempt to move the neighboring joint forcibly and the latter to the too early removal of a sequestrum.

The most common complications of acute hematogenous osteomyelitis are metastatic lesions. These occur in any of the tissues of the body, but in staphylococcus infections, the secondary lesions are usually within the bones. They occur in from fifty to sixty per cent of the cases and may develop at any time during the course of the disease. In the fulminating type of case, as many as a dozen of these lesions may appear within the first few months, but in the less severe case, the lesions usually occur at longer intervals. Each succeeding lesion is less severe than the preceding one and the pus from a late lesion, in a case in which there have been many recurring attacks, may be found to be sterile. The pericardium is more susceptible to metastatic involvement than other serous surfaces and the danger of the development of suppurative pericarditis is always present in the fulminating type of the disease.

The prognosis of acute hematogenous osteomyelitis depends upon several factors, the most important of which is the character of the onset of the disease. Death occurring in the course of an attack is usually due to the blood infection and often occurs during the first ten days of the disease. The deaths which take place later, may be due to secondary septic lesions, such as suppurative pericarditis or pneumonia. Many patients, with the fulminating type, succumb to the blood infection before the local bony lesion has fully established itself. There are other cases in which the bacteria remain in the blood for some days. This is a sign of danger; however, children with this condition may recover, though they usually develop metastatic lesions.

The symptoms that are present, in an individual case, of acute hematogenous osteomyelitis, may be entirely due to the local lesion or partly the result of a general blood infection. Consequently, they differ in quality and also vary in intensity.

The symptoms of a patient, in which the bone lesion is well localized, are those due to the reaction of the tissues in the region of the focus with accompanying constitutional symptoms due to the toxemia, but these latter are often mild and occasionally entirely lacking. The character of the lesion in the mild type of case may not be suspected for some time, for the focus which is localized within the bone displays signs that are not pronounced and these may be misinterpreted. In the more progressive type of case, the infection soon spreads out to the subperiosteal space or into the joint and may be mistaken for an abscess of the soft parts or a primary suppurative arthritis.

The descriptions of the local symptoms, as found in most of the text books on surgery, are faulty, in so far as the authors do not stress the signs that are present while the infection is still confined within the metaphysis, but rather spread themselves in their description of those which develop because of the involvement of the overlying soft parts. The list of early symptoms of a metaphyseal involvement contains but few of the classical signs of inflammation. The child complains of pain in the region of a joint and refuses to use the limb, but can be persuaded to bend the joint. To inspection, there appears to be little wrong with the area complained of, for there is no swelling or redness of the part and there may be no increase of the local temperature of the skin. An older child will occasionally show enough coöperation to point out the position of the pain, but usually, the individual is of little help, merely complaining when the diseased region is manipulated. A thorough examination must therefore be made to discover, if possible, a localized point of bony tenderness situated over the end of one of the bones, which

is the diagnostic sign of the disease at this stage. In searching for this point, the surface of the limb is carefully palpated with the tip of the finger, beginning at some distance from the suspected area. This tender spot is well localized and is commonly situated in specific areas of each of the metaphyses. The tenderness elicited in a synovitis is over the joint capsule, while that of an inflammation of the soft parts is diffuse and these are both accompanied by swelling, redness and increased temperature of the tissues.

The symptoms appear suddenly in the fulminating type of the disease. There is a complaint of pain in the affected part and the body temperature rapidly rises; frequently, the pyrexia is ushered in by a chill and the child may vomit and often a state of delirium follows. The polymorphonuclear leukocytes of the blood are increased and a bacteriemia can often be demonstrated by means of blood culture. Because of the severity of these constitutional symptoms, the local lesion may be overlooked until the cortex of the bone has become perforated and an abscess has formed beneath the periosteum, or a suppurative arthritis has developed. This type of case is frequently treated for acute inflammatory rheumatism and occasionally it has been mistaken for a meningitis. The correct diagnosis can only be reached, at this stage of the disease, by means of a careful painstaking examination, as the only local sign which is of diagnostic importance, is the localized point of tenderness over the position of the lesion.

Acute osteomyelitis is most often mistaken for acute rheumatic fever. This is probably due, in a great many cases, to the lack of a complete physical examination, which would have revealed the bony tenderness, rather than to the misinterpretation of the symptoms. Infantile scurvy has been mistaken for the mild type of osteomyelitis and is a possibility to be considered. However, it should be easily ruled out by means of a history of artificial feeding and further findings, such as the characteris-

tic changes in the gums. Tuberculous lesions of the bone are gradual in their development and run a chronic course. Tuberculosis and gonorrheal infection of the joints, though occasionally mistaken for osteomyelitis, should be easily differentiated, as the local signs are confined to the region of the capsule of the joint, as occurs in the case of rheumatic fever.

Emphasis should be laid upon the fact that the x-ray is of little positive diagnostic value during the early stage of an attack of acute hematogenous osteomyelitis, as it is only of importance when there are changes in the structure or opacity of the bone; consequently, bony lesions cannot be demonstrated unless there be absorption or the deposit of calcium salts and these changes do not occur in the early stages of an osteomyelitis. Later, at the end of a week or two, evidence of osteoporosis or the shadow of a newly formed involucrum may be observed.

An individual suffering from acute osteomyelitis should be considered as an emergency case and immediately operated upon and the sudden appearance of toxic symptoms, accompanying a point of localized bony tenderness in the region of a metaphysis of one of the long bones should be sufficient indication for such an operation.

The objects to be obtained by treatment are, first to eliminate the focus of infection and second to combat the established toxemia. In the past, procedures were adopted which aimed to remove the seat of infection immediately in a complete manner and the metaphysis or diaphysis was resected "en masse" under the assumption that the entire focus within the bone could be eliminated at once. This was a radical procedure and undoubtedly, in a few cases, produced spectacular results, but more often ended in catastrophies; fresh fields of infection were established, the diaphysis of the bone failed to reform or the epiphyseal cartilage was damaged. The most universally used operation was one that made a long incision through the soft parts over the bone, stripped off the periosteum, removed an entire wall of the diaphysis and curetted the

marrow cavity. This procedure destroyed whatever defense the tissues had established, disseminated the infection and damaged the remaining blood supply of the bone. Consequently, there was a large sequestration, the convalescence of the patient was prolonged and greater deformities were produced.

The bone lesion of acute osteomyelitis should be considered in the same light as any suppurative process within the body. The tissues within the metaphysis endeavor to localize the infection by walling it off as do the soft parts in a simple abscess. Later the suppurative process points, in an effort to evacuate the pus. The difference between suppuration within the bone and in soft tissue is that the former is more deeply placed and lies within a hard, non-expansible tissue, consequently, at first, there is a greater tendency for it to spread within the bone, if exits are not provided to relieve the tension. Therefore, the primary indication in the treatment of a metaphysitis is to provide an opening in the cortex for drainage at the earliest possible period. In the drainage of the focus, a sufficiently large opening should be made through the cortex of the bone, to keep the cavity empty and this should be accomplished without unduly damaging the remaining blood supply of the bone. Therefore, the periosteum should not be widely stripped, nor should the medullary contents be traumatized. The relief of tension, by simple drainage of an early focus, prevents the spread of the infection and eliminates the development of sequelae and complications which might otherwise occur.

The procedure is as follows: Immediately upon admission, the patient is examined and the point of maximum tenderness over the bone is determined. This point is marked upon the skin. The individual is then anesthetized and the limb prepared for operation. A sufficiently long incision is made, over the marked area, through the skin and soft tissues, down to the periosteum. The periosteum is often found to be oedematous and strips easily, or it may be separated from the surface of the bone by a

small accumulation of pus. The periosteum is incised and its edges retracted. The bone is drilled in three or four places with a quarter inch bit or burr, care being observed not to damage the epiphyseal cartilage. One of these holes should be placed close to it. If a drop of pus, followed by free bleeding, is obtained, the probability is that the infection has not destroyed the circulation of that part of the medulla. If pus alone is evacuated, the medullary circulation has evidently been damaged. The opening through the cortex can then be enlarged by removing a small piece of bone with a chisel. The wound in the soft parts is lightly packed with vaseline gauze and a dry absorbent dressing applied, after which the limb should be splinted. If a sub-periosteal abscess is found, the incision of the periosteum is usually sufficient, as the cortex of the metaphysis has evidently been perforated.

The temperature of the patient, following operation, should commence to fall before twenty-four hours has elapsed. Occasionally, it may rise again in a day or so and possibly signs of a second lesion at the opposite end of the bone or in another bone are discovered; this should be dealt with in the same manner as the first lesion. The wounds are dressed daily and the exudates removed from their surfaces. Carrel tubes may be placed in the wound of the soft parts and the exudates dissolved with Dakin's solution. Occasionally, the sinus in the soft parts contracts and has to be enlarged, but it is seldom that further openings will have to be made in the bone, until sequestration has been completed.

An arthrotomy is performed in those cases which develop a suppurative arthritis. The osteomyelitis in the metaphysis seldom extends, following its perforation, into a joint and free drainage of the joint is all the operative procedure that is required. Drainage tubes and other foreign bodies should not be placed within the synovial sac. The results obtained in the cases of suppurative arthritis which follow a metaphysitis, have been satisfactory, if the joint was drained sufficiently early.

There is hardly room in this communication to discuss the subject of such operative treatment as is required following the subsidence of the acute inflammation, however, it must be stated that this should be of a conservative nature. Sequestra should not be removed until they have fully separated and sufficient involucrum has formed. The same care in operating should be observed, to preserve the circulation, as would be during the acute stage.

The general care of the patient, during the acute stage, should be that which would be prescribed for any case of a toxic nature. The child should have plenty of fresh air and nourishing food, the fluid intake should be increased and hypodermoclyses, containing glucose, given if the individual is unable to retain fluids by mouth. Frequent transfusions of small quantities of blood are of extreme value, during the toxic stage, in increasing the resistance of the individual and are also useful in building up strength during convalescence.

Since adopting these more conservative methods of dealing with acute hematogenous osteomyelitis, there has been a reduction of the mortality and an improvement in the morbidity in the cases treated on the Children's Surgical Service of Bellevue Hospital. There have been fewer complications and disabling deformities; consequently, the period of hospitalization, in the individual case, has been shortened.

In conclusion, I wish to lay stress upon the facts that the successful treatment of a case of acute osteomyelitis lies in an early recognition of the disease, followed by immediate operation to drain the suppurative process within the metaphysis, before it has had time to spread.

ACUTE INFECTIONS OF THE URINARY TRACT *

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To achieve even an approximation of adequacy in the consideration of so comprehensive a topic as acute infections of the urinary tract, it is absolutely essential that one should always have in mind the object to be accomplished.

These highly constructive medical fortnights, so-called, conducted under the auspices of the Academy, are primarily intended for practitioners of medicine, to provide an intensive review of the cardinal points in the respective fields of medical activity, to stimulate those who in the nature of things are susceptible to such stimuli, to act as liaison officers in their contacts with recent advances in medicine and to adequately evaluate such advances.

To inject, therefore, controversial or speculative matter into the general theme of these lectures—to clutter with a plethora of statistical data or to involve them with over elaboration of technical detail, serves but to defeat the essential purpose of this laudable project.

With this in mind obvious liberties will be taken with title and subject matter—border lines crossed and re-crossed, certain features stressed, others minimized, dismissed or forgotten, because of time limitation and the intent of this paper—practicality.

The routes of infection may be by means of the blood stream—the lymphatic channel—vesico-renal reflux—any

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obstruction to normal outflow, whether extrinsic or intrinsic—direct extension—instrumental manipulation—accidental or otherwise.

The renal cortex manifests aristocratic tendencies in its receptivity to bacteria. While it is reasonable to assume that many and diversified representatives of the bacterial world enter the cortical zone, it is equally obvious that they are promptly consigned to the lower regions, before they have had the opportunity of leaving behind evidences of their customary belligerency.

On the other hand, this cortical structure is particularly susceptible to the advances of the staphylococcus and the streptococcus groups, whereas the medullary zone is the principal field of activity for the tubercle bacillus.

The chief route of advance of the above group is hematogenous and while they undoubtedly arise in some part of the body remote from the kidney—insofar as the genito-urinary system is concerned—they may be regarded as primary. By this is meant that, with but an occasional exception, they are not the secondary outcome of an antecedent infectious lesion in the lower urinary tract.

Considerable difference of opinion exists upon the ability of the kidney to filter bacteria, without damage to its structural integrity; but because of the frequency of bacteriuria and the fact that bacteria are detected in the urine where no demonstrable renal lesion is present, it may reasonably be assumed that such bacteria can, and do pass through the organ, without occasioning anything more than, at the most, a temporary lesion.

In our recent investigations into the question of bacteriophage, the observation has been made that cases presented themselves wherein, under the most meticulous aseptic precautions, pathogenic bacteria were cultured from bladder and ureter catheter specimens, whereas subsequent cultures, on the same cases, proved to be sterile, despite the fact that neither local nor systemic therapy had been instituted in the interim.

Clumps of microorganisms can form emboli completely plugging the glomerular capillaries. Such a lesion may lead to a variety of pathologic changes, such as necrosis of the glomeruli, hemorrhage and finally to cortical abscess with a surrounding zone of polymorphonuclear leucocytes. Where these bacteria collect to form large clumps and thus obstruct the lumen of the tubuli, they then become the center of a growing abscess.

Tubercle bacilli usually produce this type of lesion with subsequent caseation or cavitation of the pyramids.

Staphylococci often produce tumor-like, diffuse, suppurative abscess. These are not unlike the carbuncle (furuncle) of the skin. Israel called this lesion "carbuncle of the kidney." Such staphylococcus carbuncles will often open to the capsule of the kidney giving rise to a so-called perinephritic abscess. Second, if a larger vessel is occluded by an embolus containing virulent bacteria a corresponding area of kidney parenchyma will not only necrotize, but will also soften to form confluent suppuration. Streptococcus or staphylococcus and, less frequently, tubercle bacillus, may be found in these lesions. Tubercle bacilli soon are mixed with pyogenic organisms.

Finally—a whole kidney can become the site of a septic infarction.

These lesions may undergo one of two types of evolution. Either they effect communication with the tubuli and in turn the calyces and renal pelvis, in which event they may follow a relatively quiescent course with pronounced urinary manifestations, or secondly, and perhaps more frequently, may extend toward the renal capsule resulting in cortical or perirenal abscess with accompanying negative urinary findings, and pronounced systemic signs.

Cortical abscess pointing toward the capsule perforating into the perinephric space, or peri- or paranephric abscess with or without penetration of the renal substance, will be treated here as a clinical entity.

This condition is notable for its sudden onset. Frequently there is obtainable an antecedent history of a minor or major infectious process, remote from the organ, as infected finger, peritonsillar abscess, carbuncle, pneumonia, pleurisy or other conditions occasioning bacteriemia.

Localized pain and pronounced tenderness in the costolumbar space when associated with the constitutional manifestations as herein described, should focus attention to the probability of perinephric abscess. The condition may be inaugurated with, or its course attended by, chills. Temperature of a fluctuating or septic character is almost always present. The individual is obviously a sick patient of the septic type with a high leucocyte and differential count. The localized pain, though frequently severe, is generally supportable, and while usually limited to the costolumbar space, it occasionally extends downward.

There may or may not be tumefaction dependent upon its duration. There usually is present, muscular spasm. In advanced cases, surface hyperæmia and venous stasis may be noted.

On palpation tenderness is the first observation. On gentle ballottement this becomes accentuated. It should here be stressed that gentleness in the examination of such a patient is imperative. Without commenting on our needs of the past, there obviously is no further occasion for so crude a test as the Murphy sign. Urology has advanced to a stage where a punch in the back to ascertain the presence of a kidney lesion should no longer find its advocates. In this condition it is positively dangerous. Palpation further elicits a sense of deep seated resistance or an ill defined tumor mass. Where the case has been under observation a number of days and on palpation there is an observable increase in the size of the mass, this may be regarded as pathognomonic of the lesion.

While under certain conditions it may be justifiable to employ an aspirating needle as an aid to diagnosis, we neither use nor advocate its use in this condition.

Too much reliance is not to be accorded the usual renal colorimetric functional tests: at best they reveal a lessened output on the affected side. Cultural test of the urine in such cases should be, but is not, the rule.

The findings resultant from a preliminary x-ray are entirely dependent upon the extent of the lesion. In its earlier stages its findings may be essentially negative. Later as the condition progresses there is a blurring and loss of the customary outline. There is also frequently noticed an absence of the psoas border and a deviation of the spine toward the affected side. The latter observation is not as dependable as would appear. Cases have come under our supervision, and proved at operation to be perinephritic, in which no such deviation occurred.

X-ray of the lower thoracic region should supplement the renal study as an aid in the differential diagnosis from subphrenic abscess.

Pyelographic study: With the contention of some observers that the procedure should not here be employed we do not find ourselves in accord. When isotonic solutions of sodium iodide are used, which is our custom, untoward manifestations rarely occur, and, if they do occur, are of minor import. There may be noted distortion, narrowing and elongation of renal pelvic outline, resulting from tumor mass compression.

Preceding this instrumental method, Uroselectan should be administered intravenously and several x-ray films taken. This may, in favorable cases, at once establish the diagnosis and obviate cystoscopic instrumentation.

Difficulty may at times arise in the differential diagnosis of perinephritic from subphrenic abscess, diaphragmatic pleurisy, retro-caecal appendicitis. But an experience of many years in the observation of this condition, in its manifold phases, convinces us, these difficulties are much over rated.

At once it should be emphasized that the viability of a kidney involved by this lesion is almost wholly dependent

upon the diagnostic acumen of the practitioner, who, generally speaking, is the first in attendance. A patient coming under observation wherein even the possibility of such a condition is suspected, should immediately be hospitalized. Because the diagnosis once made, prompt operation is the indicated procedure. Avoidable delay may result in complete renal destruction and attendant removal.

As is well known, this serious kidney lesion may eventuate from relatively inconsequential, remote infection. It is obvious, therefore, that all such manifestations should be regarded with adequate seriousness and the fact remembered that apparently minor and remote infections have in themselves the potentiality for real trouble. The treatment, generally speaking, is surgical, but time does not permit of description of these methods.

As to viability of the patient, prognosis is excellent for the reason that where nephrectomy is indicated it should almost always be a two stage procedure. In advanced conditions the prognosis as to viability of the kidney is poor. Where, however, the diagnosis is made early and not too much destruction of kidney tissue involved, it is frequently possible to salvage the latter by adequate drainage.

Conclusion: It is obvious, therefore, that in the majority of instances the outcome at least, insofar as the kidney is concerned, rests in the hands of the practitioner. His responsibility is great.

PYELITIS—As its name implies, is an inflammatory process of bacterial nature involving in its earlier stages, at least, the renal pelvis and calyces—uncured or unresolved, it may and frequently does extend to the renal cortex, when it is called pyelonephritis.

It has long been regarded as one of the many prerogatives of the female sex, women and children, but as our knowledge of this affection extends, an increasing number of cases are recorded in the male.

Etiology—Again it is to be noted that this lesion fre-

quently takes its origin from a source remote from the urinary tract.

The author is of the belief that urinary stasis or back flow is a frequent contributory cause in the development of a soil suitable for the propagation of these bacteria, with its attendant consequences.

These factors will be elaborated under Pyelonephritis.

Increased mobility of the kidney, tubo-ovarian disease—gastro-intestinal stasis—the great variety of vaginal bacterial flora, the shortened urethra, pregnancy, the frequency of pelvic and abdominal operations, the inter-relationship of the lymphatics of the female genitalia and the ureter, may be considered among the reasons why the disease is so common in the female. Infectious diseases, focal infections and gastro-intestinal stases or obstructive lesions may give rise to pyelitis regardless of sex.

Here again the blood stream is undoubtedly a frequent carrier of bacteria or their irritative by-products which when brought to the renal pelvis may, under favorable conditions, give rise to pyelitis. Temporary bacteriemia is doubtless of frequent occurrence, occasioning trouble only when conditions favorable to their obstruction arise. The rôle of the lymphatic system has not been so well established.

The colon bacillus and its many varieties preponderate.

Typhoid and paratyphoid are well known blood invaders of the renal pelvis.

Other organisms may produce a hemorrhagic catarrhal type. Influenza, pneumococcus, and streptococcus bacteriemia may induce small or larger areas of hemorrhage. The theory has been advanced that many cases of the so-called essential hematurias may find their explanation in these acute or recurrent attacks of pyelitis. If there be even a measure of truth in this suggestion, it would appear advisable to culture such hematurias routinely.

Dependent upon the type and virulence of infection and the individual affected, the symptoms may range from the fulminant type with chills and fever characterized by pronounced temperature excursions, prompt elevation followed by precipitate fall. The constitutional symptoms customarily accompanying high fevers are usually present. They generally moderate or disappear with the subsidence of the temperature. Acute simultaneous bilateral pyelitis is of infrequent occurrence.

The signs and symptoms of cystitis ordinarily accompany this condition.

Urgency, frequency, dysuria, pyuria, are all sufficient for a diagnosis of cystitis. Hematuria may also be noted.

A scrutinizing antecedent history will bring out facts having a bearing on its probable cause, and a catheter specimen for culture and microscopic study confirms its presence.

Blood culture is the rule—as should also be chemical blood examination—leucocyte and differential count.

Here the local findings are not so pronounced as when cortical or perirenal abscess is present. Local tenderness is a common observation, but generally speaking it is not proportionate to the severity of the symptoms.

The management in the acute stage should be expectant rather than provocative. Elaborate instrumental and radiographic study (save for an ordinary flat plate exposure) are at this time contra-indicated. In this stage of the disease the patient should be made as comfortable as possible in the usual manner. Dietetic regulations and forced fluids, urinary antiseptics so-called, or the alkalies may be administered. They at least afford a measure of comfort to the physician, if they fail in relieving the patient. Urotropin or the citrates in large doses are the only drugs that offer a measure of solace to the author.

In any event, they should no longer be administered empirically. Coincidental studies of the hydrogen-ion con-

tent (the quantitative acidity or alkalinity) of the urine should be made. One is thus better informed as to the effectiveness of such agents, and as it is a matter of common knowledge that certain of these bacterial invaders thrive in acid media, while others flourish in alkaline, one is thus better prepared to provide discerningly an uncomfortable environment for their disturbing activities.

Culture of the urine is essential. From this is to be learned, first the specific bacteria, and secondly, if a phage or lytic substance antagonistic to the germ is to be had.

Bacteriophage implies a filterable virus, an ultra-microscopic organism, or an enzyme existing in the filtrate which may be obtained from waste products such as sewage. It probably is an ultra-microscopic organism, because of the fact that the presence of urotropin or acriflavine in such urine may inhibit the action of the phage, without destroying the organism producing the disease.

This filtrate is cultured to prove it to be bacteria free, then added to a culture of the organism obtained from the patient and if it destroys these bacteria in vitro, it is then given subcutaneously as well as by instillation into the bladder or renal pelvis, or both. For the past six months extensive investigations of the possibilities of bacteriophage in the treatment of pyelitis, have been undertaken by the Departments of Bacteriology and Urology at the New York Post Graduate Hospital. While it is still too soon to publish our observations, it may be stated that, though many failures have been encountered, we have seen a sufficient number of brilliant results, obtainable by no other method, to warrant the conviction that bacteriophage should be administered in suitable cases, and in any stage of the disease.

Routine stool studies, chemically and bacteriologically, supplement the foregoing. These specimens should be collected in sterile containers and the external parts previously sterilized. Insufficient thought has been or is

given these rational prerequisites. Colonic irrigations in right-sided pyelitis should be withheld until appendicitis has definitely been ruled out.

Blood chemistry investigation is advisable as the acid base balance of the blood in a large series of cases may add to our knowledge of the subject. In any event, it should always be known during the administration of acids or alkalies, especially in large doses, as these drugs may of themselves induce acidosis or alkalosis.

Uroselectan is administered intravenously, followed by serial x-ray photographs. This new agent tells us the precise function of both kidneys, and in the author's observation has demonstrated reno-ureteral congenital anomaly, when such abnormality escaped observation on previous cystoscopy and ureteral catheterization. It can also be carried out in any stage of the disease.

On the other hand, it may be misleading, in that it occasionally fails in delineation of the renal pelvic outline. It certainly cannot indicate the presence of vesico-renal reflux or back flow from the bladder to the renal pelvis—an observation made by the author in a case of pyelitis in a young girl, where a vesiculogram was taken. This method of examination should never be overlooked.

Uroselectan does not and cannot, nor is it intended by its authors, to supplant cystoscopy and pyelography. Its administration should be carried out only by those qualified to administer it, and interpret its findings. In our hands it has been a life-saving agent and too much credit cannot be accorded those to whom we are indebted for this new and epoch-making discovery.

In the subacute or chronic stage, cystoscopy, ureter catheter specimens are obtained for culture and microscopic examination supplemented by renal functional tests. In this manner one definitely ascertains if one or both kidneys are involved and to what extent.

Later in the disease renal pelvic layage is a popular and frequently an effective form of treatment.

Accompanying the preceding, one should find and remove the primary focus as well as uretero-renal pelvic structural defects or malposition of kidney.

Colonic irrigation, medicated or not, is helpful in selected cases.

The preceding suggestions appear to be a large order but the disease is a rebellious one that calls for a diversified armamentarium. These, however, are of little value unless discriminatingly selected and considerably carried out.

Acute pyelitis may resolve, or terminate in a subacute or chronic pyelitis or develop into acute or chronic pyelonephritis.

PYELONEPHRITIS is a suppurative inflammatory process involving renal pelvic and kidney substance. This, as well as most of the text book descriptions, gives no real clue to the process either as it exists or as it develops.

Uretero-pyelonephritis will be grouped as a corollary of this condition.

Tuberculous pyelonephritis probably originates in the medullary portion of the kidney substance coming of course by blood stream from elsewhere in the body, later takes on as a fellow conspirator, one of the staphylococcus groups, and as it progresses local cavitation ensues.

The urinary secretion charged with these irritative bacterial agents produces secondary and highly characteristic changes along its entire trajectory; pyelitis—ureteritis—early uretero-vesical sphincteritis hyperæmia and œdema, vesical ulceration, cystitis, vesical neck œdema, and in its terminal stages, urethral œdema.

Ureteral change is pronounced as renal tuberculosis progresses.

Oedema—hyperplasia—narrowed lumen—occasionally occlusion and tortuosity—all of which must of necessity embarrass its normal peristaltic action.

In its early stages the changes result from the irritative action of the tubercle bacillus, or by the products of its activity. These in the terminal stage are supplemented by the resultant mechanical factors previously mentioned.

In other words, renal tuberculosis in its early stage is characterized by trouble from above downward—in its later aspects, from below upward. It is altogether likely that when this disease extends cortically and assumes the clinical picture of perinephritic abscess, as it occasionally does, these mechanical factors play the important rôle. It is this phase of renal tuberculosis only that comes within the province of our subject.

The general symptoms are characteristic of renal tuberculosis.

Young subject, generally male—urinary frequency—urgency—dysuria—vesical intolerance—polyuria—hematuria—nocturia (this is especially significant).

The urine is light in color, highly acid—low specific gravity—always contains pus—almost always the tubercle bacillus.

Family and personal history and chest x-ray furnish the leads.

Palpation of affected side reveals moderate or acute tenderness and perhaps a tumefied kidney.

The temperature curve in this type of mixed infection (renal tuberculosis) is frequently characteristic. Marked elevation in the afternoon or early evening.

The patient is by no means as acutely ill as with a similar lesion resulting from a streptococcus infection. X-ray alone is at times helpful, at others of little assistance. This type of case has, on a number of occasions, given us the greatest difficulty in its diagnosis. Always there is much pus, occasionally no tubercle bacillus. At times it has been impossible to catheterize the ureter. To-day the diagnosis is utterly simple.

With such a clinical picture, the intravenous administration of uroselectan, followed by serial radiographic exposure, at once clarifies what heretofore has been perplexing.

It delineates the kidney outline and precisely indicates the degree of loss of function—at the same time tells us how well or otherwise the other kidney is performing its excretory duties.

Surgery is the sole recourse of the moment and to be effective must be radical. Prophylaxis and sustained observation should follow. In other words, that patient is a convalescent until every tuberculous focus near or remote has healed. Often a matter of years thereafter.

Septic Pyelonephritis. As differentiated from the tuberculous type will now be considered.

In the light of the many advances made in this subject both in diagnosis and treatment, present day text books are inadequate.

The kidney, ureter, bladder and urethra constitute the most elaborate filtration and transportation system in nature. Any interference, therefore, with the normal rhythm of this complex transporting mechanism, results in, as may readily be inferred, a wide variety of secondary change.

A case of phimosis, as will be shown you, has without other demonstrable cause resulted in complete destruction of the entire urinary system, terminating in death of this child.

Contracted urethral meatus, urethral stricture, congenital posterior urethral bands, impacted calculi, neurological lesions resulting in paralysis or atony of bladder muscle, vesical diverticulitis, prostatic hypertrophy, vesical growths, calculous disease, ureteral mouth obstruction or atony resulting in loss of contractile power, ureteral stricture, narrowing or angulation of its lumen from whatever cause, obstructing neoplasm, renal tubular or vascular

plugging, malposition of the kidney—these and other factors, many of which though comparatively insignificant in their onset, may in the course of time, result in lesions of considerable magnitude. As clinicians collaborate more and more, as they should but commonly do not, with pathologists, as they conjointly investigate the histopathological characteristics of kidney substance, a more accurate conception of minute structural change and a better comprehension of predisposing factors must of necessity eventuate.

The foregoing inventory prefaces the belief on the part of the author of this communication that obstruction plays the preponderating rôle in the production and the evolution of infectious pyelonephritis.

The elevation of critical eyebrows is not anticipated, until kidney substance is reached. But if the question is answered as to just why one kidney will filter pathogenic bacteria while its fellow of the opposite side arrests them or why a given kidney may successfully eliminate these bacteria at one time and later fail in such effort, and why it is so frequently unilateral, this speculative pronouncement will be withdrawn.

While tuberculosis of the kidney manifests its destructive and obstructive action from above downward, the reverse obtains in the causation of pyelonephritis.

Time will not permit the detailed consideration of symptomatology of the many aspects and stages of this lesion and because of their wide variation little is to be gained thereby.

Whereas much benefit may be had from a survey of methods of diagnosis and treatment. The patient comes to the urologist, as he or she should come, with a history of pain or discomfort in the region of one kidney, or intermittent attacks of reno-ureteral colic—which may or may not have had an acute onset, or the symptomatology may be negligible, and the patient referred because of considerable pus in the urine.

A preliminary x-ray generally may indicate an enlarged or occasionally its opposite, a hypoplastic kidney on one side.

In the hands of the expert the diagnosis is simplicity itself. Cystoscopic examination, urinary separation, chemical, microscopic and cultural investigation of the same. Renal colorimetric functional tests and ureteropyelographic and cystoscopic study, not only confirm or exclude the diagnosis, but what at times is of equal importance, they indicate whether conservative renal surgery is advisable and the kidney to be salvaged. Here again Uroselectan may be routinely employed. It certainly will indicate the functioning capacity of both kidneys and may delineate these organs in a highly satisfactory manner. It frequently fails in adequately outlining associated uretero-renal pelvic lesions.

At the moment it seems that this new and beneficent diagnostic agent plays its most effective rôle in acute renal infections and more especially in children.

Surgical treatment of pyelonephritis has made considerable progress, time may prove it to have progressed too far.

Until recently, generally speaking, to diagnose a case of pyelonephritis implied its removal, to-day it is probable the pendulum is swinging in the opposite direction too rapidly and too far. Right or wrong in this assumption we have to thank our European colleagues Von Lichtenberg of Berlin and Papin of Paris for their brilliant efforts in this field of conservation and for stressing what is undoubtedly true, that by adequate drainage and suspension in selected cases of pyelonephritis, many kidneys will be saved that, even at present, are routinely sacrificed.

Summary: Perinephritic abscess is a serious constitutional disease with dangerous local manifestations.

A history of remote infection though of mild and apparently local character, followed even for some considerable time thereafter by sharp pain in either kidney re-

gion, associated with pronounced temperature elevation, should at once place the lesion under suspicion. Be not misled by the absence of urinary signs.

Have early recourse to x-ray examination.

Practitioners are notably delinquent in availing themselves of this invaluable diagnostic step.

Urologists employ this method as frequently as they do the stethoscope, more frequently, I suspect.

Finally, remember the admonition about early hospitalization.

Pyelitis—here the history, symptomatology.

Constitutional signs and urinary findings, early point to the lesion.

Aside from the so-called elusive ulcer, vesical diverticulitis, neoplasm, calculous disease, the bladder may be dismissed from your mind as a factor in disease, its troubles come from below and are obstructive, or from above when they are irritative or neurological.

Culture early and often all such urines.

Culture also all obscure hematurias.

Do not overlook the possibilities in bacteriophage. When an active phage is found its administration may be productive of most gratifying results. It has salvaged at least one life since our investigation began.

Pyelitis is rarely cured by mouth medication or by expectancy.

Finally, cystoscopy is not a major surgical procedure.

Pyelonephritis: is notable for pronounced urinary manifestations. Diagnosis here, as in most urological disease is a technical procedure. Microscopical, chemical and cultural study of the urine and a radiographic examination is about all the practitioner can do for such a case. Prompt instrumental intervention and correction of ob-

structive conditions below the renal pelvis may save your patient an operation or early and conservative surgery, a kidney.

Foci of infection have an especial predilection for the urinary organs and if you would conserve your patient and deprive the urologist of the opportunity of making a livelihood, and a reputation, you will prevent or everlastingly pursue them.

The pendulum of public and professional opinion is either swinging to one extreme or the other. In the years past salicylates were given while the decayed tooth comfortably rested in its foul bed. Then came the stage when good and bad teeth were indiscriminately extracted, and salicylates withdrawn. The first implied ignorance, the second misguided enthusiasm.

When students such as Rosenow make the assertion that pulpless teeth even without demonstrable structure changes are at times a greater menace than those showing obvious destruction, and that it is not always possible to demonstrate infection in an infected tonsil and that in the presence of lesions such as pyelitis and pyelonephritis all such tonsils should be removed. This advice coming from such a source is deserving our most serious attention.

When these suspected foci are removed and the disease after reasonable time unimproved, resume your search.

Practitioners of medicine and specialists alike are either a menace or beneficent influence in the community in accordance with the conscientious care of their patients, which of necessity implies a life long pursuit of knowledge in their chosen field.

The foregoing commentaries are given with but moderate regard for precedent.

Fortunately there does not exist in medicine—in contradistinction to the law—that idolatrous worship of precedent.

order and winding up her *Leben auf aufsteigender Linie* by going over to the despised sect of Quakers, to the dismay of More and the members of her family. If the oil painting of Van Hoogstraaten be a true limning, she was dark, handsome, distinguished, upstanding, the great lady of Mazarine type recessive to the pietist. The interest of her life history to the medical profession is that it confirms what is known of medical practice in the 17th Century all along the line. In the 17th Century, laboratory science went up; medical practice sank to a level not much better than that endured by primitive savages. As always happens, the doctors of the period had unlimited confidence in this combine of Galenicals and *Dreckapotheker*, in which even courtiers dabbled. Sydenham, outstanding as the greatest internist of the century, would not loom so large, had he been surrounded by Fothergills, Lettsoms and Cullens or by Bretonneaus, Chomels and Laennecs. Sir Kenelm Digby, with the best intentions, poisons his beautiful wife with viper wine and is never again quite the *bel-limbusto* of his arrogant prime. The filth and rumble-bumble in the London Pharmacopœia are not cast out until after the publication of Heberden's *Antitheriaca* (1718). Ridicule of the lengthy prescriptions made honors easy for Mark Twain ("serve with a shovel") and their ingredients, a pharmacopœia not unlike that of the Chinese hospital in Manila, may be seen, laid out on a table, in a Strassburg colored plate of 1744, which Wickersheimer has published. Poor Lady Conway tried plasters, embrocations, red lead powders, clysters, tobacco, coffee, Boyle's *ens veneris*, the device of water let fall upon the head, the manipulations of Greatrakes and (apparently) the Universal Specific ridiculed in *Hudibras*, and even sailed to France to essay trephining, but, fortunately for her, was fubbed off by the usual Parisian expedient of venesection. She was treated in succession by William Harvey, whose indifferent reputation at the bedside is confirmed in her letters, Turquet de Mayerne, Luke and Thomas Ridgely, Sir Francis Prujean, Thomas Willis, who published her clinical history, Robert Boyle, Valentine Greatrakes, and

not one of them accomplished anything. Greatrakes contrary to common tradition, appears as a sensible, modest, well-to-do man, who made little of his cures and admitted his failures. Comes, in the end, the younger van Helmont, son of the great medical mystic, who promises much but does nothing more than to steer his patient into Quakerism. On February 23, 1678, her married life mainly a retirement to the sick room, Anne Conway dies, "giving up her spirit without any perceptible motion and keeping a very sweet face." Her brother dies in 1682, having survived the faithful Baines little more than a year. Lord Conway, after sundry essays, remarries twice, becomes Secretary of State, is deposed, survives the humiliation a few months and, with his death, in 1683, his branch of the family becomes extinct.

The 17th Century, jocund in Rubens, Herrick and Pepys, serene and pensive in Spinoza, Molière, Shakespeare and the Platonists, passionate in Donne and Crashaw, mortuary in Bach, Bunyan, and Sir Thomas Browne, lives anew in these pages. The general tone of the Conway correspondence is mortuary, the quaint English is prolix and sometimes tedious. There is the most childlike credence in signs, portents, apparitions and witchcraft, while all and sundry discuss their ailments as never before, out of sympathy, let us hope, with the long-suffering patient. There are immense dull patches, suggesting Lowell's sarcasm about the 17th Century people, that "even their relaxations were such down-right hard work"; yet the book, as a whole, makes a transcript from life as realistic as Pepys or the closely woven fictions of John Galt. The anonymous letter to Lord Conway, describing the Great Fire of London, is probably the most dramatic account of that episode outside of Defoe; and the way in which More tiptoes out of his declaration of love, after Anne's rebuff, is very amusing. Professor Nicholson has done her work well, erring, if at all, through excess of sympathy with her subject. What might seem fine writing *à tout prix* is perceived to be harmonic and contrapuntal adaptation to the quaint *milieu* and diction, very much as viola

and clarinet chime together so effectively in Mozart's trio for the latter instrument. So, too, Emerson, a 17th Century spirit if there ever was one, prefaces his essay on the Oversoul with a verse of Henry More:

"When they shall die, then God himself shall die:
They live, they live, in blest eternity."

No one will ever understand the 17th Century (Osler's favorite period), who cannot appreciate the high-pitched exaltation of these oversouled people, from the martyrdom of Bruno (1600) to the abasement of Spinoza. The recent slating of Emerson, as a phase of the current device of high-hatting substantial people in order to boost yourself, is thus more a reflection upon his critics than upon Emerson himself. The present volume is very like Goethe's sympathetic account of the fair pietist in Wilhelm Meister. Anne Conway, who, as More says, "lived in the dark much," is very much alive in these pages, but her day is yet to come. Long after her death, her name was mentioned with profound veneration by Leibnitz himself. Like the heroine of the German tale, *Sie starb in der Dunkelheit, aber es wird einst tagen*.

F. H. GARRISON.

* Conway Letters. The Correspondence of Anne, Viscountess Conway, Henry More and their Friends, 1642-1648. Collected from Manuscript Sources and edited with a Bibliographical Account, by Marjorie Hope Nicholson. XXVII, 517 pp., 15pl. roy. 8, New Haven, Yale University Press, 1930. \$6.00.

A NEW BILINGUAL OF FRACASTORIUS*

There are few of the greater physicians of the past who have had such good fortune with posterity as Fracastorius. Judging the man by the indifferent, meditative guise apparent in his portraits, his preference for a restful, retired life by the Lac du Garde, his garrulous, confiding literary manner, a veritable logorrhœa for a man otherwise taciturn, his way of getting wrapped up in a subject without regard to the reactions of his readers—all these traits betoken the careless, easy-going, good-natured being whose

inclination to "woo the strumpet Fame" was that of a sluggard, if not of a laggard. Everything about Fracastorius suggests the logical opposite of a go-getter. He has, if anything, a touch of the disinterested amiability, the indifferent ease and repose of Clelia Conti, the Duchesse de Sanseverino and the other Stendhal characters we like so well. Yet so solid is his essential performance that he eludes the common lot of Goldsmith's "Good-Natured Man," who equated "the vanity of our existence" with "the folly of our pursuits." His reputation increases apace across the centuries and to-day he stands among the "happy few" predestined apparently to win universal approbation without going after it with a crow-bar. It seems comical, for instance, that we should now call the "greater pox" (*lues venerea*) by a fanciful name which careless Fracastor distorted, by misspelling and false quantity, from Sipylus** son of Niobe, slain by Apollo. It is a delightful example of the luck of the easy-going. The poem in which the term is introduced (*Syphilis*, Verona, 1530) passed through 16 successive editions, published in 12 different European cities, the last being the piquant, vest-pocket, tercentenary reprint of Choulant (Leipsic, 1830). Of this poem, there were five separate translations into Italian, five into French, one into German and a rhymed English version (London, 1686), by Nahum Tate, who versified the Psalms, wrote many of the hymns still sung in church and succeeded Shadwell as poet-laureate in 1692. Fracastor's complete works (*Opera omnia*, Venice, Junta, 1555) passed through five subsequent editions in a century (1574-1671). Apart from the present version, his treatise on contagion (Venice, 1546) was translated into French by Alfred Fournier (1869) and Leon Meunier (1893), into German by Victor Fossel (1910), into English by W. R. Riddell (1928). F. O. Mencke, of the *Menckenii*, a relative of our well-known journalist, devoted immense labor to an authenticated biography of Fracastor (1731), who was introduced to the American profession by Osler (1906), while his iconography (statue, medallion, engravings) was investigated by Arnold Klebs (1915) and his present position in science by Charles Singer (1917). He was as-

surely no ordinary man who could thus draw unto himself, across the ages, so many willing workers, eat his cake and have it, compass at once the name and the fame, as well as the game. Fracastorius (1478-1553) was, in fact, a highly esteemed practitioner of Verona, who named syphilis (1530), first described typhus fever (1546), botanized, played with astronomy and globe-making, was one of the earliest investigators of fossils and geological formations, and author of the first reasoned statement, albeit without laboratory proofs, of the bacterial theory of infection.

The bilingual edition of his *opus magnum* by Professor Wilmer Cave Wright, now before us, signalizes a new departure of the Academy, viz. the inception of a series of monographs bearing upon the History of Medicine. The beginning is auspicious, for bilinguals of important Latin medical texts, subsequent to those of classical antiquity and similar to the medical items already published in the Loeb Series, are likely to meet a long felt want. In the case of the present volume, which is incidentally the first systematic treatise on communicable diseases (epidemiology), the task has been very properly confided to a professional classical scholar. Professor Wright has improved vastly upon the Latin-French bilingual of the late Dr. Leon Meunier (1893), which was found to contain many faulty readings in its Latin text, with corresponding errors in the translation. The present revision was effected by collation of the texts of 1546, 1550, 1554 and 1555. The biographical introduction is a valuable piece of careful research work, new to most readers. The old date of birth of Fracastor (1483) is discarded in favor of that authenticated by Barbarini (1475), thus adding eight years to his life. A clear, understandable translation and 50 pages of very helpful notes and bibliography add to the creditable scholarship manifest in this volume. The text itself, antedating Baillou and Sydenham by a century or more, is the crude ore or raw material of epidemiology, veins and grains of gold imbedded in superabundant iron pyrites. To borrow an image of Emerson's, the thyme, marjoram and other flowers of Fracastor's fancy have not yet become the

merum mel of the busier bees of bacteriology. Fracastor regards contagion as synonymous with infection and defines it (p. 5) as "a certain passive affection of elements in combination" (i.e., a metabolic phenomenon), passing "from one thing to another and originally caused by infection of the imperceptible particles"—a dreadful *petitio principii*. His three ways of contagion—by direct contact, by fomites and by action at a distance—are, as Professor Wright points out, already embalmed in a Salernitan verse—

"Seu potius morbi contagia tangere vitent
Aegrum, aegrique halitus, velamina, lintea vestes,
Ipseque quae tetigit pura corpora dextra,"

and knowledge of the contagious nature of phthisis, conjunctivitis ("evil eye") and scabies was as old as Aristotle (*Problemata*, VII, 8). It is in his view of the material agencies of infection that Fracastorius is original and stands quite apart. He saw them as *seminaria* or seeds of disease, capable of reproduction (*consimilia sibi alia generant*), of a viscous or glutinous nature (*lenta glutinosaque*), whereby they are tough and resistant, except to extreme heat or cold, and adapted, by their stickiness, to transmission by fomites. Before the advent of physical chemistry, substances of this sticky, glutinous nature occasioned in laboratories the "inspissated gloom" noted by the late Professor Remsen pending the analysis of a jelly, a glue or a gum. To-day, we call them colloidal systems, of which protoplasm is the most important and interesting. Fracastor's prevision of their ultimate nature turns upon his exquisite choice of the adjectives *lenta*, *glutinosa*—a good guess, if there ever was one. The rest of this important translation—the chapters on fevers, smallpox, measles, sweating sickness, typhus (*lenticulæ*), rabies, syphilis, elephantiasis, leprosy, scabies and skin diseases—is historically interesting by reason of the free play of critical intelligence apparent throughout the verbose exposition. Fracastorius ridicules Montanus' view of pestilent fevers as "a degree of greater putrefaction of the heart,"

and also the theory of American origin of syphilis, since the disease had become spontaneously prevalent all over Europe about 1490-92 and had existed long before, as evidenced by very old mercurial prescriptions.

The charm of Fracastorius may be sensed from his statement on retiring from practice—"There are now few, thank God, who recognize me as a physician"—or from such a dietetic interdiction as the following, from Tate's translation of his poem on syphilis—

"Forbear the drake, and leave Rome's ancient friend
The citadel and capitol to defend."

We may be sure that he laughed in his sleeves when Cardinal Bembo (a kindred spirit) likened him to Lucretius and Virgil. In this regard, he resembles Welch, who, with beautiful modesty, sees birthday honors unparalleled in the whole history of medicine as not attaching to himself but as a spontaneous tribute to the profession he represents. Such men are incapable of the "wounded vanity" which Nietzsche regards as "the mother of all tragedies." In registering our mite of appreciation of these unpretentious savants, all feel them to be above the "habit of self-reference which accompanies great, and even small reputations."

F. H. GARRISON.

* Hieronymi Fracastorii de contagione et contagiosis morbis et eorum curatione, libri III. Translation and notes by Wilmer Cave Wright, Ph.D. (History of Medicine Series, Library New York Academy of Medicine, No. (II) LVIII (3e), 356 pp. 80. New York, G. Putman's Sons, 1930.

** According to Franz Boll, proponent of this derivation, the variants "Siphylus" and "Syphilus" occur in extant MSS. of Ovid and Propertius.

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PROCEEDINGS OF ACADEMY MEETINGS

NOVEMBER

STATED MEETINGS

Thursday Evening, November 6

ORDER

I. EXECUTIVE SESSION at 8:30 o'clock

a. Report of the Nominating Committee

Nominations for President for two years, for one Vice-President for three years; for Recording Secretary for three years; for two Trustees for five years; for one member of the Library Committee for five years; and for four members of the Committee on Admission for three years

b. Election of Fellows

II. THE ANNIVERSARY DISCOURSE at 8:45 o'clock

"The preface to morals," Frederick J. E. Woodbridge, Professor of Philosophy, Columbia University

Thursday Evening, November 20, at 8:30 o'clock

THE SECOND HARVEY LECTURE

"Mass Action and Localization of Functions in the Cerebral Cortex,"

K. S. Lashley, University of Chicago

ALFRED E. COHN, President Harvey Society

DAYTON J. EDWARDS, Secretary Harvey Society

This lecture takes the place of the second Stated Meeting of the Academy for November.

SECTION OF DERMATOLOGY AND SYPHILOLOGY

Wednesday Evening, November 5, at 8:30 o'clock

(Please note change in date)

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

a. Cases from New York Post Graduate Hospital

b. Miscellaneous cases

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

Examination of cases is limited to members and their invited guests

SECTION OF SURGERY

Friday Evening, November 7, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

Cases illustrating the paper of the evening, Alice R. Bernheim, Herbert W. Meyer, David C. Bull, Isidor S. Tunick (by invitation)

III. PAPER OF THE EVENING

Thrombo-angiitis obliterans, George E. Brown, Mayo Clinic (by invitation)

IV. DISCUSSION

Harry Finkelstein and those presenting cases

SECTION OF NEUROLOGY AND PSYCHIATRY

Joint Meeting

with the

NEW YORK NEUROLOGICAL SOCIETY

Tuesday Evening, November 11, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. CLINICAL PRESENTATIONS

(from the neurological service of the Mount Sinai Hospital)

a. Gliosis of the brain stem

b. Ophthalmoplegia with remissions

c. Interpeduncular tumor; deep X-ray therapy; improvement

d. Acute luetic meningitis with recovery, Israel Strauss

e. Metastatic brain abscess, operation, recovery, Ira Cohen

III. NEUROPATHOLOGICAL DEMONSTRATION

Origin of amyloid bodies, A. Ferraro and L. A. Damon (by invitation)

IV. PAPER OF THE EVENING

Problems in the development of the nervous system, S. R. Detwiler,

Professor of Anatomy, Columbia University (by invitation)

Discussion, H. D. Senior, Professor of Anatomy, New York University

V. GENERAL DISCUSSION

VI. EXECUTIVE SESSION

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Wednesday Evening, November 12, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PAPERS OF THE EVENING

a. Reminiscences of Doctor S. Weir Mitchell, Irving Wilson Voorhees

b. Birth of laryngology, D. Bryson Delavan

c. Anatomic traditions and the old Italian universities, James V. Ricci (by invitation)

III. GENERAL DISCUSSION

IV. EXECUTIVE SESSION

SECTION OF PEDIATRICS

Thursday Evening, November 13, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

a. Physical therapy in pediatrics, Richard Kovacs

Discussion, Kristian Gosta Hansson (by invitation)

b. The value of digitalis in children with rheumatic heart disease,
Lucy Porter Sutton

Discussion, John Wyckoff, Harry Gold

c. Some lesions found in the heart in rheumatic fever, Louis Gross
Discussion, Homer F. Swift

II. GENERAL DISCUSSION

SECTION OF OTOTOLOGY

Friday Evening, November 14, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
- III. PAPERS OF THE EVENING
 - a. Nature of stimulation at the organ of Corti in the light of modern physical experimental data, Mr. R. L. Wegel, Bell Telephone Laboratories (by invitation)
 - b. Auditory nerve responses in animals and their relation to hearing, E. G. Wever, Ph.D., Princeton University (by invitation)
Discussion, H. F. Fletcher, Ph.D., Bell Telephone Laboratories (by invitation), C. W. Bray, Ph.D., Princeton University (by invitation), H. B. Williams, Columbia University
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

SECTION OF OPHTHALMOLOGY

Monday Evening, November 17, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
- II. PRESENTATION OF CASES
 - a. Melanotic naevus of the eye, Guernsey Frey
 - b. Melanotic naevus of the eye (recurrent), James W. Smith
 - c. An unusual case of medullated nerve fibers with amblyopia, S. A. Agatston
- III. DEMONSTRATION
A blood aspiration canula for lacrimal sac surgery, Daniel B. Kirby
- IV. PAPERS OF THE EVENING
 - a. The ocular pathology of Niemann-Pick's Disease with cherry-red spots in the macula. (lantern slides), David Wexler (by invitation), Isidore Goldstein
Discussion, Bernard Sachs
 - b. Social service at the Massachusetts Eye and Ear Infirmary, George S. Derby, Boston (by invitation)
Discussion, Miss Amy Smith, Massachusetts Eye and Ear Infirmary (by invitation), John M. Wheeler, Conrad Berens, Isaac Harts-horne
- V. GENERAL DISCUSSION
- VI. EXECUTIVE SESSION

SECTION OF MEDICINE

Tuesday Evening, November 18, at 8:30 o'clock

ORDER

I. PAPERS OF THE EVENING

- a. The etiology of rheumatoid arthritis and its bearing on treatment, Russell L. Cecil
- b. The differential diagnosis of rheumatoid and osteo-arthritis, Martin H. Dawson (by invitation)
- c. The function of the orthopedic surgeon in the control of chronic arthritis, Robert B. Osgood, Boston (by invitation)

II. DISCUSSION

Ralph H. Boots, Malcolm Goodridge, Earl E. Van Derwerker

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, November 19, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

Illustrative cases of teratoma testis treated by radiation, Archie L. Dean, Jr.

III. PAPER OF THE EVENING

Tumors of the testis, brief series with review of literature, David W. MacKenzie, Max Ratner, McGill University Medical School (by invitation)

Discussion, Benjamin S. Barringer, Archie L. Dean, Jr., Joseph F. McCarthy, Alfred T. Osgood

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, November 21, at 8:30 o'clock

ORDER

I. READING OF THE MINUTES

II. PRESENTATION OF CASES

- a. Fracture of the cervical spine, Mather Cleveland
- b. Report of three cases of fracture of the spine, Isaac Reitzfeld (by invitation)
- c. Report of case of fracture of the spine, Samuel W. Boorstein

III. PAPERS OF THE EVENING

- a. Treatment of compression fractures of the spine, Arthur G. Davis, Erie, Pa. (by invitation)
- b. Treatment of compression fracture of vertebral bodies by gradual hyperextension and early mobilization, William A. Rogers, Boston (by invitation)
- c. Fractures of the spine treated by fusion, with report of three cases, Walker E. Swift

SECTION OF LARYNGOLOGY AND RHINOLOGY
Coordinated Afternoon Clinic at the
MANHATTAN EYE, EAR AND THROAT HOSPITAL
210 East 64 Street
Friday, November 21, at 2:00 o'clock

ORDER

- I. PRESENTATION OF CASES
 - a. Rhinological and laryngological cases from the services of E. Ross Faulkner, John E. Mackenty, Harmon Smith, Francis W. White
 - b. Bronchoscopic cases from the service of C. J. Imperatori
 - c. Radium cases, G. Allen Robinson
- II. OPERATIONS BY STAFF MEMBERS
- III. DEMONSTRATIONS
 - a. Pathological specimens, A. A. Eggston
 - b. Roentgenological, Frederick M. Law
 - c. Intra-tracheal anesthesia, P. J. Flagg

Friday Evening, November 21, at 8:30 o'clock
(Please note change in date)
THE NEW YORK ACADEMY OF MEDICINE

ORDER

- I. READING OF MINUTES
- II. PAPERS OF THE EVENING
 - a. Pitfalls in local tonsillectomy, Harry Neivert (by invitation)
 - b. Management of nasal fractures, Francis W. White
 - c. Management of chronic tube cases, Arthur S. Wilson
- III. ROUND TABLE CONFERENCE
 - Subject "Diet in Sinusitis"
 - Abstract of recent literature, Thomas J. Harris
 - Discussion on
 - 1. Rhinological aspect, Lewis A. Coffin
 - 2. Dietetic aspect, Adolph G. DeSanctis
- IV. GENERAL DISCUSSION
- V. EXECUTIVE SESSION

SECTION OF OBSTETRICS AND GYNECOLOGY
Tuesday Evening, November 25, at 8:30 o'clock

ORDER

- I. READING OF THE MINUTES
 - II. PRESENTATION OF CASES
 - a. Hemorrhage from a ruptured varicosity in the placenta causing the death of the fetus
 - b. Rigor mortis of fetus causing difficulty in delivery, Morris Leff
- Discussion, Harbeck Halsted

III. PAPERS OF THE EVENING

a. Prolapsed umbilical cord. Analysis of one-hundred cases, Julius Kurzrock

Discussion, Frederick A. Kassebohm (by invitation), Edwin G. Langrock

b. Spinal pelvic relationship, a guide in the consideration of uterine position, Maurice O. Magid

Discussion, Arnold Sturmdorf, Armitage Whitman

IV. GENERAL DISCUSSION

V. EXECUTIVE SESSION

NEW YORK ROENTGEN SOCIETY

In affiliation with

THE NEW YORK ACADEMY OF MEDICINE

Monday Evening, November 17

ORDER

I. 8:30 p.m. to 9:00 p.m.

Demonstration of interesting cases and roentgenograms

II. 9:00 p.m.

Silver as a filter in high voltage roentgen therapy, Maurice Lenz

9:05 p.m.—Difficulties in differential diagnosis of bone tumors, Raymond Lewis

9:20 p.m.—Endothelial myeloma or Ewing's tumor, George T. Pack

9:35 p.m.—Intermediate changes and end results in the roentgen ray treatment of bone tumors, Ralph E. Herendeen

Discussion, James Ewing, Frank Adair

III. EXECUTIVE SESSION

ROSS GOLDEN, President

J. BENNETT EDWARDS, Secretary

NEW YORK MEETING

of the

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

under the auspices of

THE NEW YORK ACADEMY OF MEDICINE

Wednesday Evening, November 19, at 8:15 o'clock

I. The pharmacology of inflammation. Technic, L. Hirschhorn, M. G. Mulinos

II. Protein sulfhydryl groups, A. E. Mirsky, M. L. Anson

III. Experimental studies of amyloidosis, H. G. Grayzel, M. Jacobi, H. Maslow, H. B. Warshall (Introduced by B. Kramer)

IV. Determination of serum protein, E. H. Fishberg, B. T. Dolin

V. Influence of an extensive meat diet on human intestinal flora, J. C. Torrey

VI. Influence of age on the effect of parathormone on guinea pig bones, H. L. Jaffe, A. Bodansky and J. E. Blair

- VII. Studies on the concentration of the causative agent in the Rous chicken sarcoma No. 1, M. J. Sittenfield, B. A. Johnson
- VIII. Attempts at chemotherapy in experimental poliomyelitis, C. W. Jungeblut
- IX. Effect on costal respiratory movements of division of the phrenics following transection of the midbrain, H. C. Coombs
- PEYTON ROUS, President
- A. J. GOLDFARB, Secretary

NEW YORK PATHOLOGICAL SOCIETY
In affiliation with
THE NEW YORK ACADEMY OF MEDICINE
Wednesday Evening, November 19, at 8:30 o'clock
(Please note change in date)

ORDER

- I. PAPERS OF THE EVENING
- Hemorrhage into pericardium following rupture of a coronary artery, Charles T. Olcott
 - Generalized amyloidosis: report of a case, Duncan McCuaig (by invitation)
 - The pathogenesis of hypernephroma, David Perla, J. Gottesman
 - The pathological and physiological aspects of simple goitre as produced experimentally in rabbits, Bruce Webster (by invitation)
 - Lipoid nephrosis, Paul Klemperer (by invitation), A. R. Kantrowitz
- II. GENERAL DISCUSSION
- III. READING OF THE MINUTES
- LEILA CHARLTON KNOX, President St. Luke's Hospital
- BERYL H. PAIGE, Secretary The Babies' Hospital
-

FELLOWS ELECTED DECEMBER 18, 1930

Philip George Crosbie Bishop.....	14 East 75th Street
Herman L. Frosch.....	1985 Bryant Avenue
John Giblin.....	2 East 54th Street
Jacob Joshua Golub.....	1235 Park Avenue
Helen Harrington.....	104 East 40th Street
Leslie A. Homrich.....	39 Fifth Avenue
M. Newton Jasper.....	48 East 61st Street
Morris A. Lyons.....	269 Lexington Avenue
Joseph L. Morse.....	200 West 59th Street
Dudley J. Morton.....	21 Claremont Avenue
Florence R. Sabin	Rockefeller Institute
Edward W. Saunders.....	103 East 78th Street

DEATHS OF FELLOWS OF THE ACADEMY

SARAH DROWNE BELCHER-HARDY, M.D., 419 West 118 Street, New York; graduated in medicine from Woman's Medical College of New York Infirmary, New York City, in 1891; elected a Fellow of the Academy April 1, 1897; died, December 15, 1930. Dr. Belcher-Hardy served with the Rockefeller Institute, New York City, and was best known there for her work in connection with the regulation of New York City's milk supply, for which Rockefeller set aside a sum in the early part of this century.

FREDERIC GROSVENOR GOODRIDGE, M.D., Pomfret Center, Connecticut; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1901; elected a Fellow of the Academy May 7, 1908; died, December 17, 1930. Although a physician, Dr. Goodridge was retired from active practice.

BENJAMIN VAN DOREN HEDGES, M.D., 1225 Watchung Avenue, Plainfield, N. J.; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1891; elected a Fellow of the Academy January 6, 1897; died, December 2, 1930. Dr. Hedges was a Fellow of the American College of Surgeons and the American Medical Association. He was a member of the New Jersey State Medical Society, Consulting Surgeon to Muhlenberg Hospital, Plainfield, and Bonnie Burns Sanitarium of Union County, former President of the Society of Surgeons of New Jersey and the New Jersey State Pediatric Society.

ERNEST ELLSWORTH SMITH, M.D., 50 East 41 Street, New York; graduated in medicine from the Bellevue Hospital Medical College, New York City, in 1898; elected a Fellow of the Academy March 6, 1902; died, December 5, 1930. Dr. Smith was a fellow of the American Medical Association, a member of the Pathological Society and Consulting Pathologist to Somerset and Jamaica Hospitals.

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OF
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